

Vol. III

133

TRANSCRIPT OF RECORD.

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1920

No. 104

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ECONOMY LIGHT & POWER COMPANY, APPELLANT,

vs.

THE UNITED STATES OF AMERICA.

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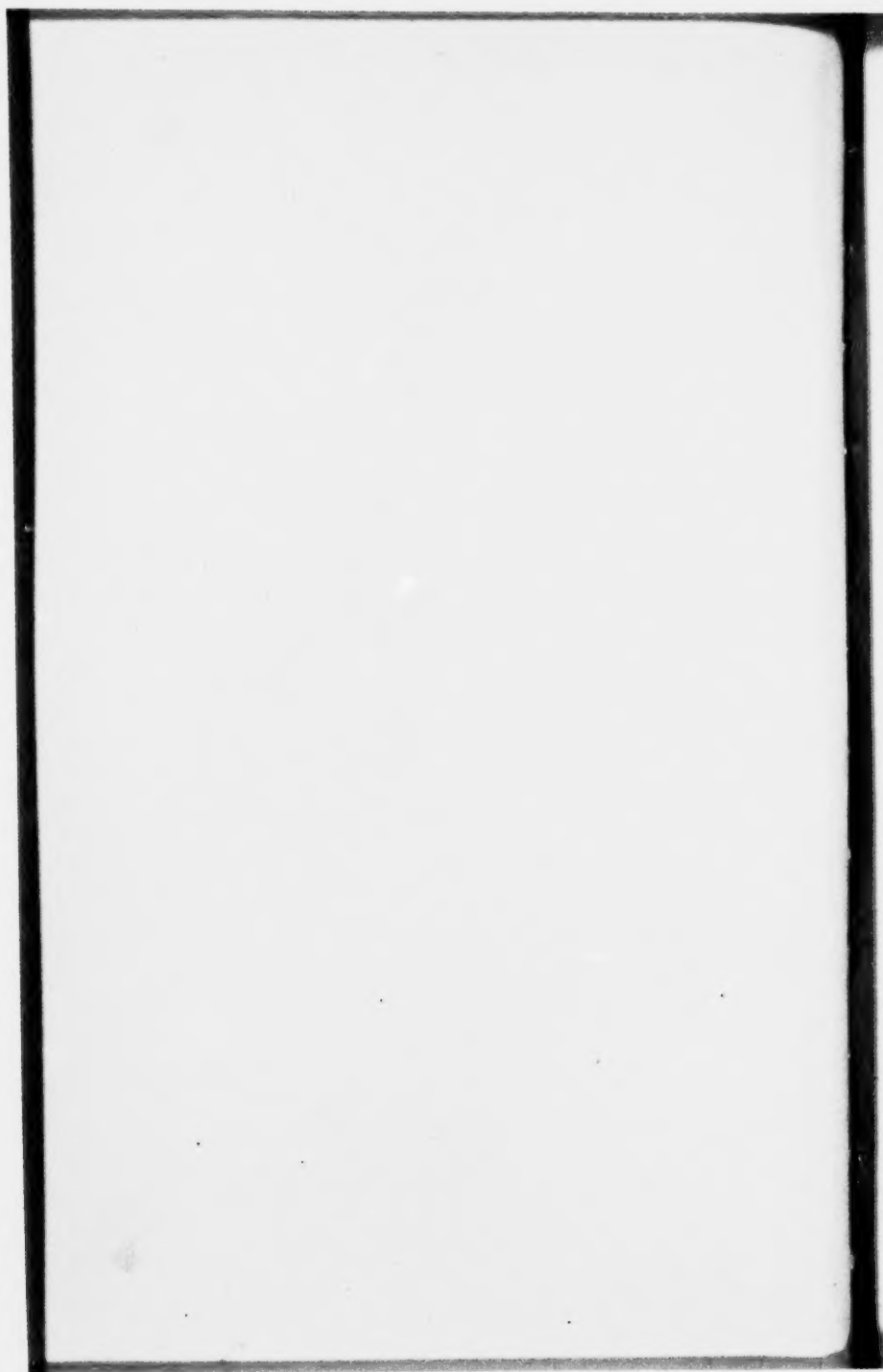
APPEAL FROM THE UNITED STATES CIRCUIT COURT OF APPEALS  
FOR THE SEVENTH CIRCUIT.

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FILED MAY 12, 1921.

(27,106)





IN THE

# District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

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UNITED STATES OF AMERICA,

vs.

ECONOMY LIGHT AND POWER COM-  
PANY.

} IN CHANCERY.

No. 29776.

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## ABSTRACT OF PROOFS.

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JAMES H. WILKERSON,  
*United States Attorney,*

BARTON CORNEAU,  
*Special Assistant United States  
Attorney,*

MORTON S. CRESSY,  
*Special Assistant United States  
Attorney,*  
*Counsel for the United States.*

FRANK H. SCOTT,  
*Counsel for the Economy Light and  
Power Company.*

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1918

THE GUNTHER-WARREN PRINTING CO.  
CHICAGO



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IN THE

# District Court of the United States

FOR THE NORTHERN DISTRICT OF ILLINOIS,

EASTERN DIVISION.

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UNITED STATES OF AMERICA,

vs.

ECONOMY LIGHT AND POWER COM-  
PANY.

IN CHANCERY.

No. 29776.

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## SUPPLEMENTAL ABSTRACT.

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The following is an abstract of certain depositions, testimony and other data, introduced in the case of the People of the State of Illinois, *Ex Rel.* v. The Economy Light & Power Company in the Supreme Court of Illinois in the February Term, 1909, No. 6242, on appeal from the Circuit Court of Grundy County, Illinois, introduced in this case in pursuant of stipulation authorizing such introduction on behalf of the United States and is as follows:

## DEPOSITIONS AND TESTIMONY.

## WITNESSES.

George W. Reed  
G. H. Erhard  
Gen'l. Alex. McKenzie  
Theodore E. Burton  
William Lorimer  
Christian T. Heydecker  
J. H. Hillebrand  
Clarence H. Palmer  
John M. Sweeney  
Robert E. Orr  
George B. Fox  
James O. Heyworth  
Arthur C. Clement  
W. W. Stevens  
Harlow H. Spoor  
James R. Flanders  
Obadiah Hicks  
George A. Parrent  
George Abbott  
Edward D. Brockway  
Eliza P. Jones  
Sam Jones  
Daniel W. King  
Frank Paddock  
Eugene Daly  
Charles Clay  
Joseph Countryman  
Samuel Gatons  
John W. Taylor  
William R. Tibbals  
W. H. Bing  
Valentine L. Schlink  
Emil Rudolph  
Herman H. Bremer  
Edgar Williams  
S. A. Van Sant  
William H. Zarley

GEORGE W. REED, a witness for complainant, testified as follows:

Page of  
Supplemental  
Transcript.

1 I live in Bradford, Stark County, Illinois. I will be  
2 eighty-four years old the 2nd of March, 1908. I was born  
March 2nd, 1824, in Clark County, Indiana, near Terre  
Haute. I came to Illinois in 1829, to what was called Reed's  
Grove, in Will County. My father settled in that place and  
bought the land there and it was called Reed's Grove. It was  
nine to ten miles from Joliet, pretty near south, and three  
3 or four miles from the Desplaines river. I lived with my  
father. I was only four or five years old then. Father  
bought and sold land. At one time he was considered worth  
\$100,000, which was a good deal of money them times, but he  
soon lost it. We were there all the time except a short time  
we went back to Indiana during the Black Hawk War (1831).  
We stayed in Indiana about four months and came back in  
the fall of the year. We came back to where my father  
founded a site where Joliet now stands and he built a log  
4 cabin and started to construct a dam and mill. It was in  
1832, in October or November. We built a cabin there,  
about four rods from where the old National Hotel stands  
now. Mr. George H. Woodruff, one of our old historians, had  
a drug store there across the street for forty years before he  
died. Father was digging a race and contemplating  
5 building a mill for grinding corn and wheat. He began  
building a dam in the river near the south end of the Jef-  
ferson street bridge. We lived in Joliet until 1836 or 1837 and  
then moved back to our old farm at Reed's Grove. In 1840, or  
a little later, my father moved to Winnebago County with me  
and in a year or two we returned to Reed's Grove. I left  
Reed's Grove in 1855 for good and went to Mercer County,  
farmed same and settled a canal claim. I farmed in Mer-  
6 cer County a couple of years and came to Stark County  
in 1857 and have lived on my farm here and here in Brad-  
ford ever since except three years that I was in the army. I  
owned my farm in Stark County and do now. After coming  
back from the army I moved to Bradford and engaged in mer-  
cantile business, continuing in it for over thirty years.  
7 My money is still in the business, as a silent partner.  
When we lived in Joliet and Will County there didn't

seem to be many fords in the river. I don't remember of crossing at but two or three places in the nine miles of the stream from there down, and that was in low water. One

8 ford was just below a little islet about 150 yards below my father's dam. Along in the summer, in the dry or low stage of the water it would come up over the wagon hubs, pretty near up to the wagon box, in fording it. There was another ford about three miles down, just below an islet. That was fully as deep as the other. It did not seem to be a shallow riffle at all, but we picked it out for a good smooth ford, the best that we could find. There was one just about a mile east of Channahon. Was similar to the others, about the same depth. I saw but little difference. There were but very few people there then and they forded generally when they could. Some forded when it was pretty deep; some crossed in skiffs and little boats they had. I don't remember them having

9 a ferry boat. There was no bridge except a foot bridge put up on long slabs in the upper part of the town. They had that one season. In high water it was between a quarter and a half mile wide; in low water it was not near so wide. I went up and down the river fishing a good deal while living at the point now Joliet. During the first year of our work there, when father had his dam partly in, one day we heard music on the river and I saw a boat coming down the river with some people on it. They were playing a long horn of some kind and seemed to be enjoying themselves bully. They came right along and went on through and down the river without any trouble whatever. It seemed to me, as far as I can remember now, that it was a kind of a flat boat or scow or maybe a ferry boat. It must have been about 30 or 40

10 feet long, maybe as long as 40 feet, and 16 to 20 feet wide. It looked to me like it was about 4 feet deep and drawing about 2 to 2½ feet of water. It might have been an old boat that this family had bought up north in Wisconsin or some place and was going down south on. They said they were going to a warmer country and that it was too cold up north for them. There were five people on the boat anyway, some men and some women. They had farming utensils and bed clothes, chairs and such like, sacks of provisions and carried a pile of such things as a family would have. We were four or five rods from them. That must have been about 1833 or near

11 that. I have nothing down by which to fix it except the Indian war and one thing and another that I remember

along about then. I observed that boat for ten or fifteen minutes, I suppose. I saw it coming from up the river for half a mile and saw it go down for half or three-quarters of a mile. It was propelled just by the current. I suppose they had paddles or poles to keep it from the shore and off the rocks. I did not see the boat have any trouble whatever in going down the river. They said they had gotten along nicely. I can't remember any other boats except skiffs. They passed up and down the river without any difficulty. By small boats I mean skiffs, scows, flat boats and the like. I wouldn't think there would have been any difficulty in using them all the time, at all seasons.

12 During most of the year the Desplaines river was of sufficient depth to permit the navigation of boats for commercial purposes. There might have been a drought or low water and at that stage it would not have been safe, but as a general thing through the biggest part of the year it took such boats as I speak of up and down without any trouble. I know that to be a fact from my knowledge of the depth of the river, as I observed it at that time. That is the way I looked at it—the depth of the river. I remember one time when I was living at Reed's Grove, before I moved south in Mercer County, that my brother was down at the river and got some wheat from a man who had gotten the wheat wet in transporting it in a boat and was selling it to the farmers. My brother fetched home five or six bushels and we spread it out on sheets and quilts to dry and use it. It was spoiling as it was, and we had to dry it to keep it from spoiling.

Q. How did that wheat get wet?

Objected to by defendant on account of calling for a conclusion, not a matter of knowledge to the witness.

A. I could not say—only this is what they said—that it got wet in a boat and they had to sell it or throw it away, so it would not do to take it along wet to market.

13 I won't swear where it was they were taking it, whether Ottawa or Chicago. They were going to market. I have no means of knowing that. I would think it was about 1842 or 1843. It must have been pretty near that date. That is the only date I am guessing at, for when I left the county it was about 1850, '51 or '52; it was before that likely that this happened—two or three years, maybe more. It seems to me that the dam my father was building was on the south side of where the Jefferson street bridge is. Things change around so on the river and canal a person gets off the track.

Mr. McKee bought the land from my father. He finished the dam and put up the mill. It was called McKee's dam. I couldn't tell how deep the boat went into the water, only by the sides that showed out of the water. It was a flat boat. I don't think it was decked over, except a double flooring in it maybe six inches from the bottom to keep the goods off the bottom. If I remember right it didn't have any upper deck. That was not covered over. It didn't seem to me to be like a ferry boat exactly, that is, covered over the top.

Q. You said you never saw any other boat going up and down the river except skiffs, did you?

A. That is all I remember of. I was not on the river very much then. There wasn't many skiffs going up and down, only just what was used in Joliet for the purpose of crossing the stream. I didn't see, that I can swear to, freight or passengers being carried up or down the river.

The only thing I learned about the boat was that the grain got wet and the man who had it was selling it out because he couldn't take it on to market. On account of it being wet  
15 it would spoil and not sell on the market. I learned that from my brother. He went down to the river and he met a man who had gotten some of the wheat, who told him the wheat was wet and there was a man on the river in a boat selling it out, so my brother went and bought some. I heard it talked in the neighborhood about it being too bad that the wheat got wet. My brother was about 20 or 21 years old when that happened. I was not so familiar with the Desplaines River in 1833 and 1834 as I was before that. I remember the Beard dam at Beardstown, across the river. I don't remember the date. It was about the time the feeder dam was put across the Kankakee. That was several years after my father was building the dam at Joliet. I don't remember Norman's  
16 dam. I don't remember any falls or anything that you could call rapids between Joliet and the mouth of the river. There were some places not so deep and some places the water was pretty swift. I don't remember any rocks across the channel. It was a pretty smooth limestone bottom. Those fords I think they did aim to find, generally, just above riffles. I don't think there was much difference between the fords and the places below, not enough to do any hurt. I never went by boat down the river from Joliet to the mouth of the stream, not the full way; I have partly. I



remember the grist mill at Treat's Island. I couldn't tell you just where the place was that that boat was from which the wheat was sold. The people on that boat with the farming implements said they were going to a warmer country. That  
17 was in the fall of the year. We raised grain on the farm at Reed's Grove. When we got to taking it any place we took it to Chicago by ox teams. We met other people. The roads were full of teams going and coming, some from Sangamon County, as far as 120 or 130 miles. I remember an old sailor along the road with me one day. He said "Do you ever drink?" I said "Yes, sometimes." He said "Well, we will have something to drink." We met an old fellow coming along cracking up his horses and he says "Here hello, give us a drink." He says "I haven't got any whiskey." Pretty soon we met another fellow. He says "I guess I have," so he stopped his team and we had a drink out of a jug. We were  
18 all jolly fellows at this time. It runs in my mind that that boat with the grain came from the Bull Bony settlement (Bourbonnais Grove), a settlement on the Kankakee river. That was way up near Kankakee city. Kankakee is right where the Bull Bony settlement was then I think. I never used the river for transporting grain. I don't remember the Havens or Adams dam. I couldn't say when that bridge was built across the river where my father's dam was built. I remember one bridge was built and went off with high water along the first part of the settling there, but I couldn't give the dates as to the building of the bridges. Those people in that boat with the farming implements said they were hunting a warmer country. I suppose they went on down out of our reach.

*Re-direct Examination.*

Q. Was the water in the Desplaines river from Lockport to the mouth of the river at the time you lived at Joliet deep enough at all times and at all seasons of the year for boats drawing from three to four feet of water to navigate up and down the river without trouble?

Objected to by the defendant as calling for a conclusion.

A. Well, I would think it was, but I would not say that  
19 it was at all seasons. I believe it was sufficient for boats drawing three feet of water during the most of the year.

Q. You base that conclusion from your knowledge of the depth of the water in the Desplaines river?

A. Yes, sir.

The fords I have spoken of we aimed to have at the shallowest places.

*Re-cross Examination.*

That is, if the shallowest place was very swift it might be that we could select a place not so swift just above. I can't say that that was the case in these instances. We endeavored to get the best bottom we could. In the extreme dry seasons I never remember having known it being so low as not to be 2 to 2½ feet deep in the shallowest places. I did not go up the river from Joliet afoot nor follow it in all its windings. I used to see it frequently. There might have been shallower places, but I don't think so.

20 Here follows stipulation to waive the signature of said witness.

DEPOSITION OF G. H. ERHARD.

The said G. H. Erhard was first duly sworn.

GEORGE H. ERHARD, a witness for complainant, testified as follows:

*Direct Examination.*

I am over 69 years old; live at Sherwin Junction, Cherokee County, Kansas. I was born in Joliet, Will County, Ill.,  
21 on Nov. 22, '38. As a resident I know of the plaintiff, the People. I know of the defendant. I know of Mr. Allen, one of the parties connected with the defendant's business.

I resided at Joliet continuously until 1893, when I  
22 moved here. After living here three years I returned to Joliet and remained until '99, when I removed my residence here permanently.

I knew the Desplaines river since I was 7 years old. In 1845 I lived right on the bank of the river and went swimming and fishing very frequently in it; saw it every day up till 1860.

The Desplaines river had different stages called high and medium stages. In the high and medium stages of water any raft or boats could run up and down the river at any such seasons when the river was not frozen, I would say from Lamont down to Dresden Heights. This is as far as I know positively

23 that such rafts or boats could be propelled in the Desplaines river. During the years I lived on the Desplaines and saw it daily there were high and medium stages of water. It was generally high during the spring and fall seasons. I would say those high and medium stages would continue probably six months or more of the year and that the water was much higher before the year 1848 than thereafter as the same was impeded and perverted from the natural flow by dams and other obstructions, and the cultivation of the soil and tile drainage caused the water to escape faster and in a larger flow than before.

Before 1848 the stream was a good sized river and I have frequently seen cattle swim the river in the summer time across to Brushy Island and the entire stream at that time was quite deep. If we did not have a dry season we would have a good stage of water all summer, and generally there was three or four months in the latter part of the year that the high or medium stages continued to exist.

During the time I resided on the river I saw small boats and rafts going upon the river. The boats went up and down the river and the rafts went down the river. They came, so far as I know, from Lamont, Cook County, Illinois, and floated on the river to south of Joliet and to the Hayden saw mill. I frequently saw the boats and rafts come into the mill containing hardwood for manufacture. I often heard of merchandise being shipped on the river, but have no positive

24 knowledge of such transaction. I remember that my brother-in-law, Jacob Adler, of Joliet, fenced a pasture across the river and was compelled to put gates across the Desplaines just below the city limits of Joliet, and that in erecting such fence he was required to and did put in a swinging gate in order to let the boats and rafts go up and down the river. The river at that time was regarded as a navigable stream and used for such purposes and for that reason he was required to use swinging gates so that the boats could go up and down the river. I was often in the river swimming and was around it fishing and knew it well from Lamont down to where the Kankakee and Desplaines form the Illinois river, which was commonly known as the Channahon district.

#### *Cross-Examination.*

I think it was in 1847 or '48 that the upper dam was finished in Joliet. Then there was a dam right on Jefferson street.

That was there before my recollection, which was torn away a few years ago; the Haven's saw-mill and grist mill dam south of Joliet. I don't remember when that was built. I think that has been torn away also. It was built when I was a small boy.

I knew of there being some rapids or riffles in the Desplaines river near to the mouth at Dresden Heights. I don't know their length. It was a great fishing place. I saw them often.

25 I have been across the rapids at Smith's bridge. Am well acquainted with the country and rapids around Brandon's bridge. I have also been at the rapids at Treat's Island. I cannot state their extent; have no knowledge, could only guess. I cannot say just what the depth of the water was prior to 1900 over these rapids. I know that there was generally a good body of water in the river before they began to obstruct the river and drain the country.

I never attempted to run a skiff over those rapids either at high or low water mark. I have seen skiffs come up and down the river at nearly all seasons. I don't know where they came from or went to.

No, it is not true that the only boats ever used in the Desplaines river were skiffs used occasionally in pools or deep places by fishermen or hunters.

26 I never personally saw boats used for commercial purposes except carrying produce, grain or freight navigating the river, except I have seen the rafts come down the river as I have stated.

I am not able to say positively, but to the best of my judgment the curves, slopes and declivities in the river did not prevent vessels from going up and down the river when the same was at a high medium stage of water.

The high water stage would probably last a month each in the spring and fall, and the medium stage, I should judge, would last for about six months, and the remainder of the year, if it was a fair season, we would have a medium stage of water most of the year, but if it was extremely dry the water would get quite low, but as for the depth of these rapids at any time I am unable to state.

27 Here follows certificate of A. H. Skidmore, commissioner.

Deposition of GENERAL ALEXANDER McKENZIE, a witness for complainant, testified as follows:

*Direct Examination.*

28 I am 63 years and nine months old; residence Washington, D. C.; occupation, Brigadier General and Chief of Engineers, United States Army.

I have been in the service of the Government of the United States about forty-four years, not including the four years at West Point. I am a graduate of the West Point Military Academy, of 1864. My official position is Chief of Engineers, United States Army. I have not been in any other service in the United States Government, excepting the Engineer Corps.

I commenced my service in Arkansas and the Indian Territory during the latter part of the Civil War; subsequent to that, for a time, I was on duty in Washington, and later on the lower Mississippi. Following that I was on duty for a number of years in Milwaukee in connection with the improvement of certain lake harbors, and subsequently to that at Willett's Point for a number of years with the Battalion Engineers and School; later than that at Detroit and at Louisville, in charge of various river and harbor works; then at Rock Island for about 17 years, and from there to Washington, where

29 I have served for about thirteen years. During the seventeen years that I was stationed at Rock Island, Illinois, I have had under my jurisdiction the upper Mississippi river, which did not include directly the tributaries. The only improvement that I had under my charge at that time was the upper Mississippi river from St. Paul to the mouth of the Missouri river.

I have necessarily made a study during these many years of my service of the various rivers and harbors of the United States; principally I might say, though with regard to many of them, through the reports submitted by other officers. All these reports come to our Department for consideration from time to time.

I know the Desplaines river in Illinois, principally through the records and reports; not particularly, personally. I have seen it.

30 Q. State whether the Desplaines river is regarded by the War Department as a navigable stream.

Objected to by counsel for defendant; incompetent, irrelevant and immaterial.

A. It is regarded officially, as a navigable stream under the law.

Motion by counsel for defendant to strike out question and answer as not responsive.

As to what is the minimum depth or water in a stream on which profitable commercial navigation can be had,—can hardly be answered definitely, because there are other considerations besides the depth which might be involved. In certain streams a very small depth, even a depth of one foot can, furnish profitable navigation, all other conditions favorable.

Q. Suppose that the boulders, if any, in a stream, be removed, and where rapids exist a lock and dam be put in, then what is the minimum depth under which or on which, profitable commercial navigation could be carried on?

Objection by counsel for defendant; incompetent, irrelevant and immaterial.

A. That could best be answered by giving such examples as we have. The plans now contemplate a six-foot navigation on the upper Mississippi river. Up to within a recent time they contemplated four to four and a half foot navigation, on which it was considered that a profitable navigation might be conducted, although that is a question of fact that could not be exactly predicted.

There are a number of rivers in the south, the upper waters of which have as little as two feet of water, upon which business is transacted.

The document now handed me, which is a record of Document numbered 264, of the Fifty-first Congress, first session,—House of Representatives Document, purporting to be a survey made by Captain W. L. Marshall of the Corps of Engineers, and transmitted by Redfield Proctor, Secretary of War, to the Speaker of the House of Representatives,—this is  
31 an official document, published by the Government of the United States, and to the best of my knowledge and belief is a copy of the original document.

Q. Will you state what constitutes a navigable river, as the same is understood and acted upon by the War Department of the United States?

Objected to; incompetent, irrelevant and immaterial.

A. The consideration given by the War Department in a question of this kind is based on the decisions of the Supreme Court; their description of what constitutes a navigable stream is in general terms that a stream is navigable in law when it

is navigable in fact, and it is navigable in fact when it can be utilized for the commerce of the locality.

Q. If a river is obstructed in certain places rendering passage of boats impossible by means of rapids or boulders in the river state whether or not that fact destroys the navigability of a river?

Objected to; incompetent, irrelevant and immaterial; opinion as to law throws no light on issues of fact.

A. Obstructions in a river, as I understand the decision of the Supreme Court, which would not completely shut off all possible navigation, would not interfere with the navigability in law, inasmuch as the floating of logs or the floating of small boats which can frequently pass over rapids, is understood to constitute navigation. I understand that such river is still, under the law, considered a navigable water. I might add that the War Department has never officially considered it has any authority to declare a river unnavigable.

The fact that the volume of water in a given river is such that it does not afford at all seasons of the year sufficient water for navigation does not destroy the navigable character of the river, according to the custom of considering the matter in the War Department.

32 The four volumes, on the back of which I find the words: "Report of the Chief of Engineers, United States Army, Volumes Numbered 1, 2, 3 and 4, 1884," are official documents, and to the best of my knowledge and belief copies of the original document.

The book now handed me, entitled: "Annual Report upon the improvements of the Harbors of Chicago and Calumet and Illinois and Calumet Rivers, Illinois; Location of Illinois and Mississippi Canal, and Operating and care of the La-grange Lock in the Illinois River, in charge of W. L. Marshall, Captain, Corps of Engineers, United States Army, being appendix J. J. of the Annual Report of the Chief of Engineers for 1890," is an official document of the Government of the United States, and is to the best of my knowledge and belief a copy of the original document.

The document now handed me, entitled: "Executive Document Numbered 16, Fortieth Congress, first session, House of Representatives," purporting on its face to be a survey of the Illinois River—a letter from the Secretary of War communicating the report of Brevet Major General J. H. Wilson on the survey and examination of the Illinois River,



—is an official document of the Government of the United States, and is to the best of my knowledge and belief a copy of the original document.

The volume now handed me, on the back of which appears these words: "Survey of Waterway from Lake Michigan to the Illinois River at La Salle, Illinois," and apparently being a volume of maps,—is an official document of the United States, and to the best of my knowledge and belief a copy of the original document.

33 The volume now handed me entitled: "Document Numbered 263, Fifty-ninth Congress, first session, House of Representatives," purporting on its face to be "A Report upon Survey, with Plans and Estimates of Cost, for a Navigable Waterway 14 Feet Deep from Lockport, Illinois, by way of Desplaines and Illinois River, to the Mouth of said Illinois River, and thence by way of the Mississippi River to St. Louis, Missouri, and for a Navigable Waterway of 7 and 8 feet depth, respectively, from the Head of Navigation of Illinois River at La Salle, Illinois, through said River to Ottawa, Illinois,"— is an official document of the United States Government, and is to the best of my knowledge and belief a correct copy of the original.

The volume now handed me, purporting to be "Reports upon Transportation Routes to the Seaboard," being "Appendix C C of the Annual Report of the Chief of Engineers for 1875," is an official document of the United States, and is to the best of my knowledge and belief a copy of the original.

#### *Cross-Examination.*

I cannot state the points at which I personally saw the Desplaines river, and I can only say that I have seen it. I have not seen it sufficiently to know any of its details and peculiarities. My knowledge of the river, of its directions and slopes is from the Government reports and Engineer's reports. I have more or less familiarity with the slopes

34 of the river and the depth of water and flow in it. I could not give the figures definitely to you as to the slopes of the river between Joliet and the mouth. The slopes affect the question of navigability materially. That is it would for up stream navigation. Of course, there are streams where the navigation would be all one way, and so the question of slopes would not affect the legal proposition so much.

The limit of slope in fact for the purpose of navigation is a question of the current and the foundation and obstructions. There are so many conditions involved, that it is very difficult to answer. I have in mind special cases where boats do navigate certain currents under certain conditions, but it may be because there is plenty of water there for them to operate in, or some other conditions. They have on the Rock Island Rapids slopes which at times give an estimated current of seven miles per hour, which boats do operate on. There is also on the Falls of the Ohio,—I do not know what the slope is,—but they do operate boats in passing from one side of the river to the other, and navigate steep slopes.

Interrogatory 37th: Now one of these reports that Mr. 35 Reeves has that you identified, is the Engineer's Report made in 1901 to 1904, that is, I refer to the report published in 1905, of survey for a deep waterway; and I call your attention to the fact that in that report it is shown that during the low water season of 1901, the fall in the Desplaines river between Jackson street and McDonough street in the City of Joliet, a distance of 5,000 feet, a fall of nine feet in this five thousand feet, being a fall of 1.8 feet per thousand feet. Now, I ask you if it would be possible for open-water navigation upstream to be carried on for the purpose of commerce over that stretch of five thousand feet with that slope?

A. I could not say, except that boats do at times pull up on lines when the water is too steep to use their natural power. I mean, by putting out lines ahead and hauling up the boats by the process known as cordelling. I would not like to state the maximum slope on which that could be done.

Interrogatory 40th: I call your attention to the fact that this report to which I have referred says that in the high water season of 1902 and 1904 the slope in the Desplaines river, between Jackson and McDonough street was eight feet in four thousand feet, or about two feet per thousand feet, and ask you if you think it would be possible for purposes of useful commerce to navigate that portion of the river upstream, or downstream either?

36 A. Well, it would be undoubtedly difficult navigation, very difficult navigation under those conditions, but whether it would be successful or not is problematical, that is difficult navigation for steamboats and barges, and that class.

It can not be said that anything of that kind is impossible. It would be very difficult, even if it was a gradual slope.

Without any artificial aids, simply a boat steaming, I think it would be so difficult as to be virtually not successful.

Interrogatory 42: Would the fact that there never had been any navigation of that particular stretch of the Desplaines river have some weight with you in making up your opinion upon that point.

A. Well, I think it would with anyone.

I do not know as a fact that there has never been any navigation on the Desplaines river between Lockport and the mouth. I do not understand that there is navigation there, that is, only stating from memory. I understand that it is not navigated. It is the impression that I have from the reports. I haven't any definite information one way or the other. There are records in our office which say that at a very early day there was navigation on the river. I do 37 not remember exactly the date. It was in the early days.

Interrogatory 47: Are you aware of the fact that from a very early day the river has had some dams in it from its mouth to Lockport bridge, clear across the river, and which would be an effectual obstruction to navigation?

A. Yes, sir.

Interrogatory 48: I call your attention to the fact that this report, published in 1905, shows that between McDonough street, in the City of Joliet, and what is called Brandon's bridge, a distance of about two thousand feet, the slope in 1901, during a period of low water, was 3.75 feet for this two thousand feet, or being about 1.88 feet per thousand feet, and that in the high water season of 1902 and 1904 the slope for that same stretch of river was about 1.1 feet per thousand feet. Do you think it would be possible for navigation for useful purposes of commerce to be carried on without improvement of that river over that stretch of the river?

A. Under these same conditions upstream navigation would be undoubtedly very difficult.

I do not understand the Desplaines river to be navigable in fact in the sense as being actually navigated at this time.

As I said before, we have some records which indicate that it was at one time, at an early date, used by a certain class of boats. I may be able to refer to those records. I 38 do not remember how far those records go. I suppose that the kind of boats used were pole boats, or skiffs,

and boats of that character. The light in which we look at this is whether this river is navigable along the finding of the Supreme Court. We use our best judgment in coming to that conclusion. From the reports which we have, I should judge that the river is not capable to-day of conducting profitable commerce, in the way commerce is usually conducted now. Whether it has in the past, or whether there was a time when it was, or not, I could not say. When we speak of the navigability, I can only say that a river, which will float a log is to us a navigable river, and undoubtedly the Desplaines river is capable of such navigation.

I do not think it is capable of carrying commerce now; whether the time ever was that the commerce made it capable of being operated profitably I do not know. As to whether there are long stretches during several months of the year between Lockport and its mouth when the water is not  
39 over twelve inches deep, I would not know without examining the record.

Interrogatory 59: Do you know as a matter of fact there are times in dry seasons when there is scarcely any water in stretches of the river?

A. I do not know that.

The Engineer's Report published in 1905 relates to the proposed improvement of that river with locks and dams in connection with the proposed fourteen-foot waterway. It was proposed as a part of the plan suggested that some locks and dams be placed in the Desplaines river.

The Economy Light & Power Company, or Mr. Charles A. Munroe, proposed to build a dam near the mouth of the Desplaines river and filed plans for his work in my office at one time. As a result of the presentation of those plans, which were simply presented for the purpose of seeing whether they were in harmony with the plans for the improvement of the river,—it resulted in Mr. Munroe being informed that under certain conditions they would harmonize with the plans for improving the river.

40 Interrogatory 64: Is not it a fact that those conditions were to be met by Mr. Munroe—that provisions should be made for a lock at the side of the dam, and that the Government should be given control of the pool to be formed by the dam?

A. Those conditions mentioned were a part of the conditions; I do not remember fully what they were.

As to rivers in the South, on which commercial business was transacted, I could not remember the rivers just now. I do not mean to say that there is not to exceed two feet at many places in the river, but there are shoals over which they pass.

Interrogatory 66: Well, on those rivers, as well as on many rivers, a question whether navigation could be carried on would depend upon the slope to a large extent, as well as upon the depth of water?

A. As I stated before there are so many conditions involved that it is difficult to answer.

Interrogatory 67: Well, if you had two feet of water in a river and a slope of ten feet per thousand feet, it would be impossible to carry on navigation, would it not, General?

41 A. As I said before, if there was an urgent necessity, there might be some way of carrying it on. I would not like to say that anything of that kind is possible.

Interrogatory 69: It would be impossible, would it not under navigation as it is carried on generally now,—it would be impossible with the character of the boats that are now used?

A. We have many cases of streams, which in my Department are classed as navigable streams, where there is nothing but log navigation.

I do not recall the slope of the river between Lockport and its mouth, as shown by Major Marshall's report, published in 1888, before the water from Lake Michigan was emptied into the Desplaines river. I have not the thought of it in my mind.

42 I cannot give any information as to whether before the water of Lake Michigan was turned into the Drainage Canal, the river could ever have been used for purposes of commerce.

There was great difficulty in navigating the Rock Island Rapids at one time. Improvements have been going on there for over thirty years. They have been removing rocks and making channels, and now they have built a lock at the lower end of the Rapids. As to whether I really recall that the total fall of those rapids was  $21\frac{1}{2}$  feet in  $14\frac{1}{2}$  miles—about 18 inches per mile or about 4 inches per thousand feet will say those Rapids are not continuous, they are simply a series of long pools, connected by rapids, so that the fall there is concentrated in a number of places.

S. T. Abert was United States Civil Engineer on duty with the Engineer Department. I could not say without referring to the records whether he recommended at one time the improvement of the Yadkin river in North Carolina. It is my impression that there has been work done on said river by the Government, but what improvement has been made I could not state off hand. I do not recall any of the data about this river.

43 Major E. R. Ruffner, now Colonel, is an Engineer Officer in the United States Army. I do not recall that he made a record of his opinion to the effect that the limit of slope for open river navigation is about 18 inches to the mile. Colonel Ruffner is still a member of the Corps of Engineers, stationed at New Orleans.

I could not tell whether the Yadkin river is now used for purposes of commerce. The reports of the Chief of Engineers will show.

Q. You expressed the opinion, did you not, to Secretary Taft last year that the Desplaines river was not navigable in fact and that consequently, the Secretary of War had no jurisdiction over it?

A. That was I presume in connection with a hearing that the Secretary had in regard to that river. I do not remember that I fully expressed the question of the navigability under the law. That was not the principal question involved at that time. That hearing, in a general way, was a protest on the part of Mr. Isham Randolph against the proposed construction of a dam by the Economy Light & Power Company at Dresden Heights. As I recollect, it was an informal presentation by persons representing the State of Illinois against the state being deprived of certain rights and authority in connection with the water power connected with the fourteen-foot waterway.

44 Well, I will say, the statements made at that hearing that the river was not navigable in fact, was my general thought as to the present condition, and was not made exactly in relation to the actual legal conditions. As I recollect in that matter, the Secretary in his finding, which was an impromptu matter, made a reference to the fact, of non-navigability, but that was based principally on the presentation made by Mr. Snapp, and the fact (the Secretary did not have to decide whether it was navigable or not). That was not a part of the decision.



Referring to these answers, as I have said, our Bureau of the War Department would not consider that they had any right to decide that a river was unnavigable in law. The only way in which such a matter comes before us is where permits are asked for, and then the Secretary has to determine the question, and he will naturally determine on the safe side.

In a general way, the policy of my department is to  
45 consider all rivers navigable that could be improved and made navigable, where there is a prospect of their becoming a useful line of navigation according to the present day methods.

*Re-direct Examination.*

The surveys that are made of the different rivers and harbors of the United States by officers of the Engineer Corps, are all reported to the Chief of Engineers, and by him reported to the Secretary of War, and by him transmitted to the Congress. The War Department determines whether or not a river shall be regarded as navigable or otherwise, from whatever information may be available, and to a large extent from the reports above mentioned.

The War Department, of course, obtains a great many reports that do not go beyond the office of the Chief of Engineers. Where we find a slope in the river creating a current too rapid to be navigated, it is naturally not a good river; it is still a river subject to improvement. The way a place of that kind is treated, is by putting a lock in the stream, or in other cases, by cutting out a channel or smoothing it. Both methods are used. Well, the river, I should think, would still be considered a navigable river, even if there were occasional places where navigation was quite difficult.

46 The statement that in order to accommodate navigation and make navigation easier and better the rivers have been improved by the state or general government applies to a very large number of them. Take the Mississippi river, as that is important. It was necessary to put a lock and dam in it. The necessity for this lock and dam, as in the illustration just given, does not at all detract from the fact of the navigable character of the river. In the case that I mentioned above these rapids, it was originally navigated by a special boat.

In my reference to the early navigation on the Desplaines



river, that was a very general statement I made, and not connected with the subject of cordeling. I simply stated that I have knowledge of that way of handling boats. In early days there was no way of transportation hardly except by water. In the matter of cordeling, that is applied to either small or large boats. I remember the case of the expedition up the Yellowstone river a great many years ago, in which they pulled the boats up for miles.

I recall that there was a survey and report made by  
47 Major Long about the year 1819 of the Desplaines river and transmitted to the Congress by John C. Calhoun, Secretary of War, in which the Desplaines river was reported as a navigable river, and advice was given as to how, by slight improvements, it could be made a great waterway for commerce; but I have not seen it for years. I do not recall the details.

In the Upper Savannah river, I know there were used what they called push boats on the upper portions of that river, which to-day would be considered almost useless for commerce. There is evidence that such boats propelled by poles, did carry cotton.

The Santee river is one of the rivers I had in mind when I mentioned some of the southern rivers, whose depth of water was two feet or less. The same condition is true of the Upper Tennessee river. I would not give the depths, but it is true it is a shoal stream. There are a number of cases of  
48 rivers of that sort in the southern states, that are now being navigated for navigation purposes, where the water is less than two feet.

In regard to the hearing before Secretary Taft in February, 1907, according to my recollection, the statements with regard to the navigability of the river and the connection of the government with it, were made by Congressman Snapp. I do not remember anyone else, and they were probably adopted, except by the Secretary of War.

#### *Re-cross Examination.*

The only record made with regard to the navigability of the river, was when the question was asked the department. According to my recollection it was asked by the Attorney General of the State of Illinois, and it was simply up to us to give an answer, and we recommended to the Secretary of War

that he answer that the river was navigable. As to whether he meant by that that the river was capable at the present time of being used for carrying commerce, we did not mean to go any further than we did, we simply had to give an answer to the question asked.

49 I knew there were dams on the Desplaines river. In considering the question of the navigability of a river, we are not influenced by the existence of dams which were put in without permission. No permission was obtained from the Government for the construction of any of those dams. No protest was ever made so far as I know by the Government against the construction or maintenance of those dams. My department has been aware of the existence of dams in that river for a great many years. All those dams we knew were obstructions to any possible navigation of the river.

Interrogatory 113th: Just to be perfectly clear about that hearing that was had before the Secretary of War in February, 1907, I hold in my hand what purports to be a copy of the proceedings had upon that hearing, and I ask you, General, if the following interrogatories and answers did not take place between you and the Secretary of War:

Secretary Taft: As a matter of fact it is not now navigable (referring to the Desplaines River).

General Mackenzie: It is not now navigable.

Secretary Taft: And if they sunk a 14-ft. channel in the river and affected private interests they would have to buy them, would they not?

50 General Mackenzie: Yes. As Mr. Snapp says, these plans were brought here to the War Department. They were looked over and compared, and the War Department wrote a letter stating that if they satisfied certain conditions they would be in accord with the plans proposed by the Board of Engineers for the 14-ft. waterway. I have a copy of the letter.

Secretary Taft: But you are not seeking to exercise any authority over an existing navigable stream?

General Mackenzie: No, sir.

Secretary Taft: Or to grant a permit so as to protect the interests of the United States in the stream?

General Mackenzie: No, sir.

Secretary Taft: Suppose they were to go ahead without coming here at all. You could not go into court, or could not, by an order of this department, prevent them from doing anything, could you?

General Mackenzie: I do not think we could. Of course, under all the conditions, so far as they have gone, possibly we could call the attention of the Department of Justice to the matter, simply to have them consider it as a legal proposition.

Secretary Taft: Where would the Department of Justice get any power?

General Mackenzie: Only from the general law—that in case of any violation of any law for the protection of navigable streams.

Secretary Taft: Yes, but the Desplaines River is not a navigable stream, is it?

General Mackenzie: It is not, today, sir.

Secretary Taft: And it could not become so except by a declaration of Congress to carry work on it?

General Mackenzie: That is it exactly.

Secretary Taft: Then where do I get any power to  
51 deal with it at all?

General Mackenzie: I do not know that there is any, Mr. Secretary.

Were those questions and answers given at that hearing before Secretary Taft, as I have read them?

COUNSEL FOR COMPLAINANT. I object to this as being no part of the cross-examination and immaterial in this cause.

A. I suppose, essentially so, but the explanation must go with this, with the fact that there was no question of a permit. There was no question as to the legal status of it, and there was no necessity for the Government to exercise the power of stopping anything. All they could do was to report it to the Department of Justice, which would consider the law in the matter.

Interrogatory 115: I would like to get this thing clear, General, so that I can understand it thoroughly. I gather that your opinion and position in the matter is this; that as a legal question, whether the river is navigable in law, or whether the United States has any right to regulate it, is a question that you cannot pass upon, and not intending to express any opinion except the United States and your department consider all rivers navigable until somebody proves them otherwise?

COUNSEL FOR COMPLAINANT. To that I object, as a statement not warranted by what the witness said.

COUNSEL FOR DEFENDANT. Do I state your position fairly, General?

A. Essentially, yes. We do take that view on the ground that there is no authority outside of Congress and the court that can declare a river navigable.

Interrogatory 116: So, on the other hand, you do not mean to say that when your department states this is a navigable river, it does not say that useful commerce can be carried on that river with improvement?

A. We do not pretend to answer that question.

Interrogatory 117: You do not pretend to say this; that commerce can be carried on without improvement of the river?

A. I do not pretend to make a statement in that connection. We consider it navigable in law. We do not consider it navigable in fact. (See answer to No. 49.)

*Re-re-direct Examination.*

52 The inquiry by the Attorney General of the State of Illinois as to whether or not the Desplaines River was a navigable river, was about the 21st day of October, 1907.

The document now handed to me is the answer of the War Department to that inquiry from Attorney General Stead. The suggestion that that answer be given to the Attorney General was made from our office.

Thereupon the letter, identified by General Mackenzie, dated "War Department, Washington, D. C., October 28, 1907," addressed to the Hon. W. H. Stead, Attorney General, State of Illinois, Springfield, Illinois, and signed by Robert Shaw Oliver, Acting-Secretary of War,—was received in evidence and marked "Exhibit A." (Abst., 181.)

Objected to as being incompetent, irrelevant and immaterial, and the following stipulation was entered into between counsel:

"It is agreed between the parties that a carbon copy of a letter, dated October 21, 1907, purporting to be a letter addressed to Hon. William H. Taft, Secretary of War, Washington, D. C., and signed W. H. Stead, Attorney General, is a true copy of the letter to which 'Exhibit A' is a reply, and that said carbon copy is hereto attached marked 'Exhibit B.' " (Abst., .....)

53

*Re-re-cross Examination.*

There is a record in my department in regard to some action relating to Charles A. Munroe.

To the best of my recollection, nothing has ever come to the department from this Economy Light & Power Company.

There is no application for the approval of the plans to the best of my recollection. The question presented by Mr. Munroe was whether the plan submitted would be in harmony with the work of improvement proposed by the Government.

55

"EXHIBIT A."

*John P. McMahon,  
Notary Public, D. C.*

WAR DEPARTMENT.  
WASHINGTON.

October 28, 1907.

Dear Sir:

Answering your letter of the 21st instant, in which you ask to be informed whether the Des Plaines and Illinois Rivers are navigable between Lockport and Utica; also whether the War Department has been called upon to pass upon the right of the Economy Light and Power Company of Joliet, Illinois, to dam the former river, I beg to inform you that the Des Plaines and Illinois Rivers at points mentioned in your communication are considered by the War Department to be navigable streams.

There appears to be no record in the Department of any action relating to the Economy and Power Company of Joliet.

Very respectfully,

ROBERT SHAW OLIVER,  
*Acting Secretary of War.*

Hon. W. H. Stead,  
Attorney General,  
State of Illinois,  
Springfield, Ill.

54

"EXHIBIT B."

JOHN B. McMAHON,  
NOTARY PUBLIC, D. C.  
B—III.

October 21, 1907.

Hon. William H. Taft,  
Secretary of War,  
Washington, D. C.

Dear Sir:

A question has arisen in this department involving the proposition whether or not the Illinois and Des Plaines Rivers between Lockport on the Des Plaines and the village of Utica on the Illinois are navigable rivers. Will you kindly advise me if the Department of War has been called upon to pass upon the question as to whether or not said rivers are navigable rivers of the United States, and particularly if the Department has passed upon the question as to the right of the Economy Light and Power Company of Joliet, Illinois, to construct a dam across the Des Plaines river just above the mouth of the Kankakee river. If your Department has passed upon and determined the question as to the navigability of those streams or of either of them, I wish you would send me a certified copy of the finding of your Department. The cost of such certified copy, or copies, will be promptly remitted upon receipt of a bill therefor.

Very respectfully,

W. H. STEAD,  
Attorney General.

L.—4.

56 THEODORE E. BURTON, a witness for complainant,  
testified as follows:

*Direct Examination.*

My age is 56 years; legal residence, Cleveland, Ohio; by occupation attorney, though I have been here now for quite a considerable time. By here, I mean, Washington City.

I am a member of Congress; I have been a member of

Congress consecutively since 1895, and also from 1889 to 1891. Since 1895 I have been assigned to the River and Harbor Committee, and have been chairman of that committee since December, 1898. I have made a study of the rivers and harbors of the United States necessarily in connection with my position. Well, of course in the preparation of river and harbor bills and hearings, and considerable amount of attention here at Washington, and then I have visited most of the leading rivers of the United States and a considerable number of the minor streams. I do not know how much time I have occupied in that—quite a number of months probably; that is, I have occupied in visiting.

57 I was in Europe for four months at one time, investigating river navigation and have given some slight attention at other times. I went to Europe especially to study water transportation and things of that kind. I have been identified for about a year past with the Inland Waterways Commission, appointed by the President, consisting of nine members. I was Chairman of the Commission, made so by direction of the President of the United States, and also by the formal confirmation of the members. In pursuance of that appointment I have made a considerable study and some examination of rivers and harbors and means of transportation in the United States. The examination, however, was over waterways which I had already visited.

They would include a pretty large list of rivers: The Penobscot, Merrimac, Hudson, Delaware, Patuxent and James, the Inland Water Route on the east side of North Carolina, the Congaree, Santee and Wateree in South Carolina, the Savannah, the St. Johns, the Alabama, the Coosa, the Black Warrior, the Warrior, the Tennessee, the Cumberland, the Atchafalaya, the Sabine, the Neches, the Trinity, the Brazos; and, of course, the larger rivers, the Ohio and the Mississippi; and on the Pacific Coast, the San Joaquin, and the Sacramento, the Columbia and the Snake.

58 I have visited these different rivers with a view to their examination and study with reference to their improvement by the Government, and for a study of the general problems. There are some minor rivers which I have visited and which I have not mentioned in the list just given.

I have seen the Desplaines River in Illinois, though I have never been on a boat on it. I have seen it at a place where



the Drainage Canal empties its water into the river, and upon a course where it parallels the Drainage Canal, though that is the diverted channel—the artificial channel alongside.

Q. State what constitutes a navigable river?

Objected to, incompetent, irrelevant and immaterial.

A. Of course, there are a number of definitions that you can find in a legal dictionary, but really defined it is a river which can be utilized for the profitable transportation of commodities of commerce by boats or otherwise. I do not think you can fix any standard as to what volume of commerce would be necessary to have on a river to constitute it a navigable stream.

In 1902 I prepared a list of the rivers in the country, which carry respectively less than 50,000 tons, and less than 100,000 tons, or a traffic worth less than one million dollars—and this is perhaps wandering a little—made a comparison with minor railroads. There are some streams that are under improvement and profitably navigated that do not carry more than ten thousand tons a year, or even less.

As to whether a river, which was capable of floating a boat that would carry a bigger load of freight than could successfully be hauled by wagon, was navigable,—depends somewhat upon the topography of the country and the course. Generally speaking, I would say that the capability for carrying a load in competition with other available means of carriage would render the navigation of a river profitable, whether by wagon or in any other way. You can even conceive of competition by carrying on the back, as they do on the road from Vera Cruz to Mexico. This is the best known road in the new world, and for a part of the way, it is impossible to go with teams. That would be an extreme case,—where navigation competes with carriage other than by vehicles.

Q. Is it necessary for a river to be capable of being navigated by boats carrying freight for commercial purposes the entire year in order that it shall be regarded as a navigable river?

Objected to, incompetent, irrelevant and immaterial, and asks opinion of witness on a legal question.

A. No.

Q. It is necessary for a river to be navigable through its length in order to be a navigable waterway?

Same objection.

A. No; partly because detached reaches may be available for navigation and the obstacles may be removed; partly because you must take a river as an entirety, and in maintaining the regimen or the flow it is necessary to control the whole river, including those portions in which there are obstacles by reason of rapids, as well as those portions where the slope of the river is such as to render the navigation of the river difficult or impossible.

If obstructions appear in parts of a river by means of boulders in the water, or rapids in the river, do those facts destroy the navigable character of the river?

Same objection.

A. No; particularly because capability is a test, rather than actual use, and partly for the reason I have already stated, that you must take the river as a whole; and for securing the proper flow in those sections which are navigable without improvement, you must also take into account and have control over the portions which are not navigable without treatment.

60 The Columbia River is a navigable river. There is a portion of that river, relatively midway in its navigable part, called "The Dalles," through which boats do not pretend to pass. There is another obstacle between "The Dalles" and the mouth of the Willamette, and then at Priest Rapids and a number of other places there are obstacles in the way of rapids. Obstacles such as the ones just mentioned do not take from a river its navigable character.

As to what is the minimum amount of water depth that I know to be navigated in the United States for profitable commercial navigation,—that is a question which is somewhat difficult to answer, because the statistics as to most of the rivers are for low-water depth. Rivers are profitably navigated at a depth of 20 inches, or even less. Perhaps I had better qualify that statement,—on a draft of 20 inches or even less.

Well, there is the Tar River, the portion of it in North Carolina, that has only 20 inches. Then on the rivers in the cotton country, between the Mississippi and the Atlantic, there are boats which carry cotton and other commodities profitably on a draft say of sixteen inches, though the rivers at certain seasons have greater depth and the boats can draw more than that. Take for instance the Ocmulgee, the Oconee, the Coosa, the Alabama. There is a river in the State of Dela-

ware known as Smyrna River, the original depth of which was  $2\frac{1}{2}$  feet. It has now been deepened until it is considerably more than that. There is a large number of three to four-ft. rivers where profitable navigation is conducted. Of

these a very large list could be given. The Tennessee, 61 from Chattanooga to Knoxville, at times does not have a depth of more than eighteen inches, and boats occasionally are used on that river on a draft of not more than eighteen or even sixteen inches. Of course, the Ocmulgee and Oconee, at certain seasons of the year, have a greater depth than that; most of the year they have a greater depth than 1 have named, but boats are used on them with only that draft. The projected depth of these two is three feet each.

Interrogatory 32: From the study and investigation that you have had of rivers and the knowledge you have of the Desplaines River in Illinois, state whether that is a navigable stream.

COUNSEL FOR DEFENDANT. I object to that.

Interrogatory 33: If the Desplaines River, for a period of three or four months in a year, exclusive of the time it is frozen over, contains a depth of water ranging from eighteen inches to ten feet in depth, and the river ranging in width during these times at from sixty feet to a quarter of a mile, without reference for the moment to the question of slope, would you characterize that, or say that it is a navigable river?

COUNSEL FOR DEFENDANT. To that question I object on the ground of its being irrelevant, incompetent and immaterial, and on the ground that not sufficient facts have been stated in the hypothetical question upon which a proper answer can be made.

A. Well, I take the question as this: A minimum depth of eighteen inches for at least three months of the year, and a width varying from sixty feet to a quarter of a mile. I would say it is navigable.

Interrogatory 34: If in the Desplaines River there are rapids in places, and boulders or stone on the rapids, would that fact take the river out of the list of navigable rivers?

A. Not necessarily. It would depend somewhat upon what share of the river was made up of rapids and what share of channel, with a slope not too great for convenient navigation.

The method of treating or improving a river where 62 there are stones or boulders in the river's course is, well, there are quite a number of ways; one is to take out the

rocks or the obstacles. That, however, frequently lets out the pool above, and while it does away with the rapids at the obstruction created by the rocks, it diminishes the level of the river in a portion that is navigable. Of course, if it is a mere detached rock, the way is to pick it out, blast it, or remove it in some other way; another is by the construction of what are called "wing dams" going out at right angles to the bank at the side to narrow the channel of the river. That does not necessarily overcome the rapids. Still another way and the one that is most effective, is the construction of locks and dams. I would say that the improvements of such rivers as have been improved have rendered them more valuable as navigable streams. Of course there are a great many rivers which have not been improved by the United States Government. If you take all the streams which are styled rivers, a majority of them have not been improved. Nearly all the rivers of the United States that are actually being navigated, have been improved in one or more of the methods I have suggested. I did not state I should say here, all the methods of improvement. Other ways of improving are by wing dams, longitudinal dams and dredging. These are the principal means employed. Of course, where it is a great alluvial stream, the protection by revetment to prevent the washing out and where there are great floods, levees or other methods. The matter of improvements of rivers and harbors by the Government of the United States, that is to say, the question of whether they should be improved or not, is a question that is primarily submitted to the Committee of the House of Representatives, of which I am the Chairman.

*Cross-Examination.*

Interrogatory 39th: Mr. Burton, you define a navigable river as one which could be used for profitable commerce in competition with other means of transportation. Suppose a river cannot be used for profitable commerce in competition with other means of transportation unless improved largely throughout its length, would you consider that to be a navigable river?

A. I would consider that navigable.

In actual practice I should say you will hardly ever find such a stream. A river will be navigable in a certain portion

of it, say 4 miles here, then there is an obstacle; then 2 miles, then there is another obstacle. Now, these separate stretches or reaches of the river can no doubt be navigated, and that makes it a navigable stream; but I would make the definition broad enough to include a stream which can be rendered navigable by improvement. It is hard to say whether it is a legal proposition. My experience has been so combined, so made up of study of actual physical conditions of the rivers, their navigability, the uses to which they are applied, with the legal proposition, it is pretty difficult to say whether I regard that as a legal proposition or a question of fact. Under my definition all streams are not practically navigable streams; unless it promises returns for the money invested in its improvement, I should not say that river was a navigable one. It is true that is a practical view to take of it. But if a river is all cut up with rapids, and where the expense of treating it and capitalizing would more than counterbalance any benefit derived from the use of it, I would question whether that should be regarded as a navigable stream. You must take into account that I look upon it from the standpoint of the benefits derived from improvement, the expense and difficulty of improvement.

64 Interrogatory 43rd: Well, suppose the Desplaines River, of which Mr. Reeves has asked you, is 18 miles long from Lockport to its mouth, and that it would take at least three locks and dams to make that river capable of navigation, actual navigation, with heights of eighteen, twenty-one and twelve feet, lifts at the locks, that river having a fall in those eighteen miles of about sixty-six feet, being an average of about four feet per mile, and the river being paralleled by the Illinois and Michigan Canal, used for purposes of transportation and by three trunk railways, would you say that was a navigable stream?

A. What is the depth of pools that would be created?

COUNSEL FOR DEFENDANT. That would be somewhere between twelve and fourteen feet.

A. I would say that would be navigable, most certainly.

I think it would be profitable to do that work for the purpose of navigation. There are rivers in France, I do not recall the names just now, where there are locks every half mile. You must bear in mind that on so comparatively a short stretch as that, that difficulty of handling at the beginning and the end of the railway, and of the maintenance

of a canal—canals can never be made equal to a natural stream unless you make them abnormally wide—would cut a very considerable figure, and navigation would be a profitable means of transportation. Of course the rate on a railroad would be very much higher per ton mile for such a distance than it would be on a river—both the actual rate charged and the actual expense. Whether or not this river in its natural state or in its present state, is capable of navigation for the purposes of useful commerce, would depend somewhat  
65 on the slope and the length of the pools which are not impeded by rapids. It has not been stated how long those pools are. The facts have not been sufficiently stated to me to express any opinion as to whether the river is, or is not navigable; I would say if there were three obstacles in a distance of eighteen miles, it would depend on the length of the rapids, or extent of the obstacles at those places, but there would be, at any rate, navigation on the detached portions, if the obstructions by rapids or other obstacles, are not unusually long. It would be capable of navigation over the portions where the obstacles do not prevent. An ordinary rapid is not an inseparable prevention to navigation. The rule as laid down in the text books of seventy-five years ago, was that about  $1\frac{1}{2}$  ft. per mile was the maximum consistent with convenient navigation, but since then methods have been devised to overcome rapids. Take it at the iron gates of the Danube—there the descent is considerably more than that. Just above the boundary line of Hungaria and Roumania, Servia being on the opposite side, Hungaria taking the responsibility and taking the lead, they have a fixed post and a drum on the boat, and wire rope that hauls the boat by power in itself over the rapids. The slope of those rapids in places must be 4 ft. or more to the mile. I think I am conservatvie  
in stating that.

66 As to this Desplaines River, my impression is for the whole river, a descent of 100 ft. in 60 miles.

Interrogatory 53rd: Now, Mr. Burton, assuming that between Jackson street and McDonough street in the City of Joliet, a distance of about 5,000 feet, nearly a mile, there is a fall of 9 ft., or about 1.8 ft. per 1,000 ft., during the low water season, and during high water season, there is a fall of about 2 ft. per 1,000 ft. Now, on 18 inches of water, which was the minimum depth given in the hypothetical question that Mr. Reeves asked you—do you say that boats carrying



commerce could navigate up and down that stretch of one mile without the improvement of it?

A. I do not think so, if it is say only 18 inches deep.

Interrogatory 54th: Well, suppose it was 2 feet.

A. I do not think so. That however would not take away the quality of the stream.

Whether the boats could be navigated up the stream as it now exists, well, it would be very difficult, if not impossible. I have come so to consider the legal question and the practical questions together, that it is pretty difficult to separate the two.

Interrogatory 56th: Now, below McDonough street in Joliet, and between that and Brandon's Bridge, assume that there is a fall for a distance of 2,000 ft., of 3.75 ft., or about 1.88 ft. per 1,000 ft., during low water, and that during high water, the fall for the same stretch of river is about 1.1 per 1,000 ft.; this being a stretch of river just below the 5,000 ft. stretch that I have already asked you about, would you say that if there was from 18 inches to 2 ft. or 3 ft. of water, that it would be possible to navigate boats used for commerce up that stretch of river?

A. It would probably be possible, but not practicable without treatment of some kind.

67 Interrogatory 57th: Now, assuming Mr. Burton, that from Lockport to Brandon's Bridge, a distance of about 7 miles in those 18 miles of river, there is a fall of 34 ft. of continuous descent; and assuming now that a dam which is called dam number 1 existed there, and will be removed, and there will be a continuous descent of 34 ft. in a distance of 7 miles, or about 5 ft. per mile, do you think it would be possible, with the water from 18 inches to 2 ft. in depth, to navigate that stretch of the river for the purpose of useful commerce, without any improvement?

A. It would be very doubtful. It could be navigated by devices which could be employed if the stream is fairly straight without treatment of the channel.

If there is a sharp bend in the stream that would be a serious obstacle, it would depend of course, upon the width of the channel and the depth of the channel. It is very likely that the channel would be deeper or shallower around the bend.

Interrogatory 59th: Well, now, I will ask you another hypothetical question. There is a fall between Lockport and Bran-



don's Bridge, a distance of 7 miles, of 34 ft. or about 5 ft. per mile. Then, there is about 5,000 ft. between Jackson street and McDonough street, with a 9 foot fall in that 5,000 ft. Then from McDonough street to Brandon's Bridge, there is a fall of 3.75 ft. per 2,000 ft. Then a little below that, along Treat's Island, for a stretch of 2,000 ft., there is a fall of 5.5 ft. A little below that at a point called Smith's Bridge, for a stretch of 3,000 ft., there is a fall of 2 ft., and a few miles below that, at Dresden Heights, where this dam of the Economy Light & Power Company's dam is in process of construction, for a stretch of 2,000 ft., there is a fall of 3.2 ft. Now, with these falls, what do you say as to the capability of that river being navigated, in its present state, from the mouth to Lockport, for the purpose of useful commerce?

A. Well, it would be very questionable whether it would be navigated for that whole distance. If I may express an opinion, that would not take away the quality of the stream as a navigable stream, if part of the way there are pools that are readily navigable, and there is a terminal point beyond the end of the pool that by treatment could be made navigable—it is still a navigable stream for the whole distance.

I mean the Federal Government would have jurisdiction over it, particularly because it would be necessary to control that upper portion to make sure that the water flowed without obstruction through the lower portion. It seems to me this is a question of fact, as well as one of law. That is, it would readily appear that if the jurisdiction, which has control of the navigability, did not have supervision over this season, from which the water means comes to furnish the normal depth below, the jurisdiction would be futile. You presented several propositions relating to different portions of the streams, different conditions in this different reaches, that are widely different. On some of them I would say that it is difficult, if not impossible, for a boat to go up without in some way improving the stream, and on others not so difficult. It would not be so difficult to go down, but that also would be difficult, and in some places probably impossible, consistent with safety.

The limit of slope for the purposes of useful navigation would depend on two or three things; first, the depth of the stream; second, the width; third, the course of the

river, that is, whether straight or crooked. I have not the exact figures in mind, but I think on a slope as much as 8 or 10 feet, boats are drawn-up stream by those devices which I have suggested,—some point to which a rope or chain can be attached and a drum with power on the boat. Well, the Elba is one river in which the above method is tried as much as any. There the depth at low water seasons is not very great, I should say about 3 feet. I don't think it is a fact that there are 407 miles of chain in the Elba River, and that those chains are now being used where the slope is as flat as 1 foot in 3,300 feet. It is not a very difficult task to go up a slope which is only a foot to a mile. I am very familiar with Vernon Harecourt's book on the "Rivers and Channels of Europe." It is a very good book, although not always accurate. I was misled by it in an address made before the Geological Society last winter. I made an error by relying on the statements of this book relating to the size of the river basins of the world. I have not the exact figures in mind, but there are some very steep slopes in the

70 Rhone River. I am not positive as to the slopes of those European rivers, but I am quite positive that 4 foot slopes can be used for navigable purposes, for open water navigation treated perhaps by lateral dams or dikes. These, however, increase the difficulty unless they are located at a place just at the point where the flow of the river is more smooth without so much descent. As to the slopes of the southern rivers, well, take part of the middle section of the Tennessee, that is 2.75 feet in the mile. The fall from Knoxville to Chattanooga is on the average about one foot to the mile, though in some places it is very materially more than that. I should think the maximum slope where there is a navigation in those rivers, would not be greater than 4 feet. Take the Allegheny—that has 2.2 feet over long distance, and in some places more and in some places less, of course 2 to 3 feet to the mile. In the upper portion of the Monongahela, that is, that portion that is in West Virginia, it is about 2 feet. That is the average descent of course. There, as in the other case, there is sometimes more and sometimes less.

As to knowing any river where navigation is actually  
71 carried on and where the slope is more than 4 feet to the mile, why for down stream navigation, the St. Lawrence at the rapids must be more than that. I am not positive, however, as to the figures. In some portions of the Ten-

nessee, between Chattanooga and Riverton, it must be more than 4 feet at different stretches of water. Commerce is carried on up-stream to no great extent in the St. Lawrence. They go down through the open river with some boats, and go up through a canal. I think there are records that give the exact slopes there of those European rivers. I do not recall them, however. I have not studied any of them.

Interrogatory 72nd: Assuming that in the Desplaines river, from Lockport to its mouth, a distance of about 18 miles, there is one pool of water about 5 1/2 miles in length, and another pool about 3 miles in length, making altogether about 9 1/2 miles of pool, and that the remainder of the river between Lockport and its mouth, about 9 miles, consists of stretches, of rapids, of slopes, that I have mentioned here, do you say that that river, in its present state, without improvement, is capable of being used for profitable commerce?

A. It is pretty hard to answer that question, yes or no. If you say for the whole stretch of the river, I would say "no." If you say for those portions, I would say "yes," and would add that the navigating of those portions gives a character to the whole.

I should take it it would be impossible to run a boat from one end to the other over rapids that are so steep.

Interrogatory 74th: Particularly in view of the fact that some of these rapids to which I have called your attention, extend 2 or 3 miles in length; for instance, the rapids from Jackson street to Brandon's road is a little over 3 miles.

A. The rapids are 3 miles in length?

Interrogatory 75th: That is, in the first 5,000 feet, the descent is 9 feet, then comes a stretch of 2,000 feet where the descent is 3.75 feet; then comes another stretch where the descent is 5.5 feet for 2,000 feet. That would be over 10 feet per mile—11 feet per mile. And then comes another stretch of 3,000 feet, where the descent is 2 feet for the 3,000 feet.

A. Well, if the stream were without obstacles, was fairly straight, that would not do away with the possibility of going through it with boats. The other portions that you mention as 11 feet, I should think would not be navigable with any device now in use.

The portion 6.9 feet to the mile, would be difficult, if not impossible. As to 8 feet to the mile, you are getting down there I think to the limit, of course there is very rarely a stream where for miles the descent is uniform. You take it

where it is 8 feet to the mile, probably in a portion of it it will be at a rate that you call it; at another as much as 12, and in another probably 6. Well, suppose a stretch of a mile or 1/2 mile in the river, that is probably uniform of 8 feet to the mile; to carry on useful commerce would be expensive, but if there is a part of the stream which above the pool could be readily navigated, that would not in my opinion take away the navigability of the stream. I must say in this connection I had not considered the exact feature, the slope up which and down which boats go. It would be rather interesting to look up those figures, because the conditions are so different in different places. I should hesitate to venture an opinion as to whether boats could be taken up and down the Desplaines river, as it now exists, without more complete details as to the depth, width and general nature of the channel. I am of course limiting my answers to the portions which you describe, in which the descent is so sharp. As to whether the Desplaines river has ever in fact been navigated, I could not say that I had any information that is accurate that it has been. I had always understood, however, it had been used for purposes of navigation—some old  
73 narrative about a portage across there from Lake Michigan, connecting with the Desplaines and going down it. I was not aware there had been as many as nine dams in that stretch of the river during the last forty-five or fifty years. That would seem to show that that was an industrial center before Chicago was.

Interrogatory 83rd: Would you not say, Mr. Burton, that the fact that all those dams were constructed in the river, is persuasive evidence that the stream was not capable of navigation for useful commerce?

A. No, I would not decidedly. I have known instances in which persons, even by Acts of Congress have managed to sneak in a dam where they ought to be barred for doing so. I remember one instance in which it was done in the Tennessee river, and the next winter the people who were advocating it, wanted it repealed.

As to having any of the facts as regards the condition of the river in its natural state, I have none, except superficial ideas from reading reports, and I have never given any special attention to that locality, except as connected with the proposed drainage channel, and have not in mind the course of the stream between its mouth and Lockport, except as I have just casually examined it on the map.

74 WILLIAM LORIMER:

*Direct Examination.*

My name is William Lorimer. I am forty-six years of age. I reside at Chicago, Illinois. My occupation is that of manufacturer and general contractor. I am a member of Congress and reside in Washington during the sessions of Congress. I am a member of the Committee on Agriculture and Committee on Rivers and Harbors. I was elected in 1894, and was out one term of two years. The remainder of the time I have been and now am a member of Congress. I was assigned to the Committee on Rivers and Harbors of the House of Representatives in December, 1903, I think. This is the third Congress of two years during which I have been a member of this committee. I have during my service on this committee given study and investigation to the general proposition of Rivers and Harbors, and during my service in Congress, I have given study to the waterway between Chicago and New Orleans. That waterway would be from Lake Michigan through the Chicago river and Sanitary District Canal, and beyond that, any course that might be adopted by the State or Federal Government, either the Desplaines river or the Illinois and Michigan Canal, or a canal that might take it down to the south side of the Desplaines river by the Kankakee, and then through the Illinois river into the Mississippi, and on to the Gulf. I am acquainted with the Desplaines river. I have given it study for about twelve years. I have known it for thirty-eight years.

Interrogatory 12th: State whether or not, Mr. Lorimer, the Desplaines river is a navigable stream.

Objected to as incompetent, irrelevant and immaterial, and as an opinion for which no foundation has been made.

A. It is a navigable stream.

Q. What is a navigable stream?

Same objection.

A. A river that is capable of bearing boats, upon which can be transported commerce, deep enough and wide enough, with water enough. As to what minimum depth of water in the channel of a river affording from 60 feet in width to a quarter of a mile in high water, boats can be built to bear commerce over water that draw 2 feet in depth. I know that

in my personal experience. From the study and investigation that I have had of the navigable waters of the United States, in connection with my official duties, I have known of navigation on the Tennessee river, parts of it at times was of less than 2 feet of water.

Q. Does the fact that there may be for a stretch in the river, rapids or stone or rock, destroy the navigable character of the stream?

Objected to; incompetent, irrelevant and immaterial; no foundation laid for question.

A. No, it does not.

Q. Basing your opinion on your experience and absorption on the one hand, and your study of Rivers and Harbors, in the course of your work as a member of the Committee on Rivers and Harbors of Congress, does the fact that a 76 portion of a river contains rapids or boulders, in any sense destroy the navigable character of the river?

Same objection.

A. It does not.

Q. If a river has sufficient water to carry boats a part of the year, say three or four months only, exclusive of the time that the river may be frozen over, does or does not that state of affairs destroy the navigable character of the river?

Same objection.

A. No.

#### *Cross-Examination.*

When I stated that this was a navigable stream, I mean that it is a navigable stream because it can be navigated by boats that are capable of carrying the commerce of the country. I know that first of all, because I have been over the stream during my lifetime practically all the way from its mouth to the Town of Wheeling, and I know that between the Illinois river and Lockport, there is minimum depth between the low standard stages of the river, certified to by the engineers that made the survey, over the rapids to the mouth of the river, of not less than 3 feet of water, and over the rapids at Treat's Island, of not less than 2 feet of water, and that only for a distance of about 500 feet between those two rapids, there is a depth of water all the way from 4½ 77 feet to 15 feet. Beyond Treat's Island, up to and through Lake Joliet, there is a depth anywhere from 4 feet to 17 feet. It is all the way from say 125 feet to 1,500 feet wide.



That width of 1,500 feet is in Lake Joliet, and between Treat's Island and Lake Joliet, it is more than 1,500 feet wide in some places. The nearest point, according to my recollection, is round Treat's Island, what might be called right there according to the position you are viewing the river from, either by the north side of the river or the west side, there is a big considerable turn right there. I haven't any doubt that a boat we are all familiar with, the Illinois Fish Boat, could be so equipped with engines, as to navigate all the way from St. Louis to Lake Joliet. I got the information as to the depth of water over the rapids, from the report of the engineers, the one making the survey from Lockport to St. Louis, that was published in 1905. That is the only survey for the 14 foot waterway.

I know that boats without any extensive expenditure for machinery, can navigate the river from the rapids at Joliet to the mouth of the Desplaines river. Then I am quite sure that a boat of the character that I just mentioned, the Illinois Fish Boat, can be equipped with machinery so that it can go up the river. I did not ever hear of a boat of that character going up or down the stream. I did not ever know that part of the river, or any boats being used for commercial purposes, being navigated up or down the river;

78 I have known of them being navigated for commercial purposes above Joliet. As to the depth of water not being the only matter to be considered in the determining whether boats can be navigated, of course if a stream was too narrow, that would control. The slope could be so much at Dresden Heights and at Treat's Island, and is not so great that boats could not be navigated. I think about  $4\frac{1}{2}$  feet is the slope from Dresden Heights down to the Illinois river. As to supposing the slope at Dresden Heights to be 1.6 feet per 1,000 feet, or 8 feet to the mile, I have gone over the ground there in the low water stages of the Desplaines river, and there is no doubt in my mind that you can take boats up the Desplaines from Dresden Heights. Suppose the slope to be 8 feet to the mile, as shown by this report of the engineers of the United States Government, boats for the purpose of profitable navigation could be run over those rapids by cordelling, without any doubt. That is, they could be so equipped that they could be built up conveniently and rapidly. I have never heard of it being done, but I know enough about machinery to know that they could be equipped for that pur-



pose and operate profitably. I have never run a boat line, but from what I know of rail rates and water rates, I have no doubt that goods could be transported from St. Louis to Joliet by water, and cordelling over those rapids that we are discussing, for less than you can take it there by rail, and therefore it is profitable. As to how you would get over the dam at Marseilles, the Illinois river is susceptible of improvement, so you could build a lock there and carry it out 79 through the lock. The Illinois river is under improvement. If it were improved at such points as needed improvement, of which Marseilles is one, boats might be run up the river. For easy navigation, there should be improvement all the way up the Illinois and the Desplaines rivers to Joliet. Boats could not profitably, for a commercial purpose, in the conditions of things as they now exist, without any improvement, be run from St. Louis to Joliet.

There would have to be some improvement in the Illinois river. Well, now you put the question whether or not it would be profitable, and I can only answer that, based again on the statement I made a little while ago, on the difference between the railroad and the water rates. If the Illinois drawing 24 inches of water, to pass through the river into the Desplaines river, I have no doubt about it. There is not any doubt but what a boat drawing 24 inches of water, could go from the mouth of the Desplaines river up to Joliet now; well, to the foot of the rapids at Joliet, that is, to Bran- 80 don's Bridge, that neighborhood. As to a boat drawing 24 inches of water going over the rapids at the mouth of the river at Treat's Island, the proof of that is the depth of the water, 3 feet. Now, if it is admitted that a boat can be cordelled over the rapids, and that I believe, then for the balance of the way there is plenty of water. There is 8 to 15 feet in the first stretch, and  $4\frac{1}{2}$  feet to 17 feet in the second stretch, to the head of Lake Joliet, a distance of 6 miles. In other words, there is in those two reaches, a depth of from  $4\frac{1}{2}$  feet to 17 feet, over a stretch of about 9 miles of water. Now, there is depth enough there over those rapids, for a boat drawing 24 inches, to pass over.

I know the length of the rapids between the mouth of the river and Joliet; I know from memory and not exactly, pretty close. I should say altogether—there is altogether from Joliet to Dresden Heights, or the mouth of the river, I think

there is somewhere in the neighborhood of 4 or 5 miles. I do not pretend to be accurate as to the exact distance, but somewhere in that neighborhood; that is, from the foot of one rapids to the mouth of the Desplaines river. I remember what the conditions of the river are with reference to the rapids, from Lake Joliet to Lockport. Well, boats could go up there, and I believe boats could be so equipped that they could be taken up there. I do not know of any boats now on any of the rivers that are so equipped as to go up that stream, but there isn't any doubt in my mind about being able to go up to Dam No. 1. They could not get 81 through that dam. To make it a first class navigable stream, there must be locks and dams, and my opinion is, the locks and dams can be constructed without any difficulty at all, and when I say that, I mean to say I know it can be done. As to the state of the river being now such that useful commerce can be carried on, commerce can be carried on from the foot of Treat's Island to Joliet, no one will dispute that. You could build a boat that could go from Treat's Island up to the head of Lake Joliet, that could carry 1,000 tons of freight. I do not say whether the commerce is there, and do not know whether the commerce is there. I know that it is capable of handling the commerce. There is commerce between Treat's Island and Lake Joliet, but the commerce is not carried on on the river. As to whether, if a line of boats were constructed between these two points, it will be profitable and useful to the community, that would depend altogether what sort of commerce it is, and what it is to be used for.

I can tell you a little experience I have had myself. I was at one time doing some work on the Desplaines river, and I had a cofferdam I was having a good deal of trouble with. I got a load of crushed rock, and brought it down the Illinois and Michigan Canal, to a point where the canal crosses the Desplaines river, cordelling it up about a mile. The reason we did that was because we could handle the rock cheaper that way than any method we could devise, so that for a distance of 6 miles, under the same conditions, it would be 82 profitable. It was profitable to us, and that is why we did it. From my own personal knowledge of the river, I would say that the river was capable of being used for commercial purposes. I know that you can use the Desplaines river from the Joliet & Eastern R. R., for a boat drawing 9 feet of water down to the City of Joliet, and for the pur-

poses of transporting stone from anywhere along up there in the neighborhood of Lockport, down through the Drainage Canal, into the Desplaines river, to unload at Joliet. There is no doubt of its being profitable to transport stone down that way. The work I was doing when I used that stone, was lowering the bottom of the Desplaines river for the Sanitary District.

That from the fact that there are several pools in the river, where a boat could be floated, and could be made to carry, for a short distance, produce or stone, I say that the river is capable now of being navigated for the purposes of commerce. It is not necessary that a river shall be navigable, in fact in all its length, to be a navigable stream. For instance, the Potomac river is navigable up to and a little beyond the City of Washington, and there is a considerable fall about ten miles out from here, but the Potomac river is a navigable river beyond that point. And the Desplaines river, connecting with the Illinois and Michigan Canal, which is a navigable stream of the United States, and capable of navigation and transporting commerce profitably, and into the Illinois,—is a stretch of navigable waterway of the United States that commerce is actually transported over; so that it makes part of the Desplaines river actually navigable and properly so, and I consider it a navigable stream for that reason, although in parts it could not be considered navigable. The fact that a part of the Desplaines river is used by the Illinois and Michigan Canal, and is navigable, does not alone make the whole river navigable. The river is actually navigable, and nobody will controvert this statement. Below the City of Joliet and Treat's Island, and below the rapids at Treat's Island, and below the rapids at Dresden Heights, it is actually navigable at the shoalest point of 4 feet. Then  
83 it is actually navigable from Dam No. 1 to the Drainage Canal below Lockport; and that is a navigable waterway declared by our Legislature when a certain quantity passed through it, because the largest ship navigating the Great Lakes, can actually navigate it. The minimum depth of course runs down to 3 feet below the rapids. To the foot of the rapids below Treat's Island, there is actually 4 feet. I can only say that the report made on the 14 foot waterway, made from Lockport to St. Louis, shows that there is no point between the mouth of the Desplaines river and the foot of the

rapids at Joliet, where the water in the low standard stages, is not 2 feet deep, and that is only for a distance of 500 feet. Over the rapids at Dresden Heights, my recollection is that 3 feet is the lowest. As to the date when the river was gauged, well, it was gauged for a considerable length of time, and the gauge reports are contained in that report that you have before you. The report published in 1905, was before the Sanitary District water was turned into the Desplaines river. As to the condition before it was turned in, I have never made investigation, and do not know a thing about it. Before this report was made, I had no information as to the depth of any part of it. The reach above Treat's Island to the foot of Lake Joliet could have been navigated, I am quite sure, prior to the time when the Sanitary District water was turned in. After taking boats up from the mouth of  
84 the river to the City of Joliet, I do not know what the depth was there in the low stages of water, and for that reason, cannot express an opinion. That there was a stretch of the river, above Joliet, where large boats 9½ feet in depth could navigate, was because of the improvement in the river there by the Sanitary District. I do not know how deep the water was before the tailrace was constructed or the quantity. I think I had better say that from the time the canal was opened, there has been passing all the way from 225,000 to 420,000 cubic feet per second when the bear trap was down. Now, part of it, or may be all of it, flowed over this part of the river that we are referring to. I do not know how much, and I do not think anybody else does. I do not know how deep it was for that reason. It is possible to take the water coming from the Sanitary District Channel, the main channel, and discharge it into the Illinois river, below the proposed dam of the Economy Light & Power Company at Dresden Heights, without discharging the water into the Desplaines river. The water in the Sanitary District Channel, coming from Lake Michigan, is taken through the channel and discharged into the Desplaines river, by authority of the court, of the Legislature of Illinois, and by permit from the Secretary of War, to divert it from Lake Michigan. Congress might stop this permit at any time.

Interrogatory 71st: The stretch of water in Lake Joliet, that is between Brandon's Bridge and the head of Treat's Island, would not be affected in any way by the construction

of the proposed dam of the Economy Light & Power Company?

Objected to as not important and not relevant.

85 A. To be truthful about it, I could not say. My opinion is from what I have heard about it, that they would construct above the level of Lake Joliet. I do not know about it as a matter of fact.

The proposed dam would not decrease the depth of water in Lake Joliet. It might make Lake Joliet wider, I do not know about that. I do not know the exact depth of water prior to the time when the Sanitary District Canal began its discharge in the Desplaines river. I never knew until this report was made. From observation, I have known from time to time what,—in the low stages of water now, I know that there is water enough at certain periods of the year, coming from the natural watershed of the Desplaines Valley, to make a considerable flow of water over those rapids.

Interrogatory 76th: In your judgment, Mr. Lorimer, would the construction of the proposed dam at Dresden Heights, interfere in any way, with the proposed deep waterway, if proper provision for locks were made at that point?

Objected to as not being cross-examination, and not relevant to the matters at issue.

A. Locks could be built there to pass boats through.

### *Re-direct Examination.*

COUNSEL FOR COMPLAINANT. I will ask Mr. Lorimer to state any fact in connection with this matter about which you have not been specifically asked.

A. As a member of the Rivers and Harbors Committee, and on account of the work that I have been doing, and the searches that I have made for information, I have come to the opinion with reference to waterways, and that all members of the committee that I have known, have thought a waterway that is navigable in part is navigable in fact, and even though it may be interrupted by rapids or perpendicular falls or sand bars, as long as it may be made navigable, it is a navigable waterway of the United States, and I know that a part of the Desplaines river, from the end of the Sanitary District Canal, where they have a lock that they can lock boats through down into it now, is navigable for boats of 8 feet of draft, and it is navigable for boats that can carry

a considerable commerce through the Desplaines river, into the Illinois and Michigan Canal, and connect with the Illinois river at La Salle; and I know that it can be so improved as to connect with the Illinois river, and made navigable for boats of any length—six hundred feet long, drawing 24 feet of water, capable of carrying from 6,000 to 12,000 tons of a cargo; and it is because of that knowledge and information of the surroundings, and its capabilities, that I make the statement that it is a navigable waterway of the United States, and because our courts have so decided—have made the Illinois and Michigan Canal a navigable waterway of the United States, and a part of it is the Desplaines river. It is the connecting point of navigable waterways of the United States. I never had any doubt, for the last ten years, of the navigability of the Desplaines river.

I think, as far as I know, and that is up to Wheeling, I think there is watershed enough there to take care of the seepage, and make the Desplaines river navigable up to Wheeling. We call Wheeling 25 miles northwest of Chicago—from Milwaukee avenue, Chicago. It is in Cook County. It is above Chicago, on the Desplaines river.

Deposition of C. T. HEYDECKER:

*Direct Examination.*

87 I live in Waukegan, Lake County. Have lived in the county nearly sixty-two years, ever since I was born. Will be sixty-two in September next. Was born in Mill Creek, now Wadsworth, Newport, Lake County, Illinois, a scant mile from the Desplaines river. I lived there until I was twenty-one. The river flows from north through the town. I became familiar during those early years with the physical condition of the river from the state line to the south line of

Lake County, and also with the current reputation as to the history of its use. In the winter time I would skate down it; in the spring and summer we would find good the summer and in the autumn. From the state line to the south county line is twenty-four miles. Lake County is the duck shooting and fishing in it. As much as half a dozen winters I made trips on the river, between the ages of twelve and twenty-one, and about the same number in the spring and in



northeastern county of the state. It joins Cook County on the south. The river flows through Cook County below. Beginning at the state line the river is in a bed with a considerable bank on either side, running about six miles, then it strikes a place where it spreads out more into the prairie again, but there is a well defined channel with a bed, but not such a deep bed, with bluffs on the sides of it, for about six miles. In the winter, in the spring or in high water time it would overflow out of its course, over its banks; then it would go down for about five or six miles again; well, two or three miles in there that would have a tendency to overflow; then it strikes what is known as the Gurnee bridge, or what is called the old O'Plain bridge; it used to be called the O'Plain instead of the Desplaines. It is also spelled Au Plain. The name C'Plain was in more current use among the neighbors. There was a little cabin in those days that went by the name of the O'Plainhouse here in Lake County at what is now Gurnee. It is the same river that we now call the Desplaines.

Then it runs in a deeper channel from there down to the county line. I think about a mile or a mile and a half this side of the county line, and swerves out again just above what was known in the early days as the Vincent mill, now known as the Struckmann mill. In some places, as I say, it would be down in a deep gorge and in other places it would not be so deep, and the east bank of it nearly all the way through was heavily timbered with oak, walnut and some hickory and softer woods. It has been cut off now. In the north part the timber was cut into cord wood, much of it. Some of it was taken to the mills; in the south part it was taken to the Struckmann mill. The logs ran down in strings of logs about five or six miles. There was no occasion to raft them because the earliest I remember it, the Struckmann mill was in there with a dam. You couldn't have put the logs over it only by rolling them. There was a saw mill there and they floated in there and I have seen logs in the dam there above the mill, in the mill pond.

There would be places where those banks would be eight or ten feet high. Then you go down to another place there would be deep holes, and then there would be a shallow place, but in summer time the banks of the river would be up eight to ten feet above the water in some places and in some places they would be down so that you could ford through.



91 During the spring months, March, April and May, I think the water ran off along in May some time; it would go down in June. The bed of the river would be full and overflowing on the flats.

It would be six to eight or ten feet of water; the bank would be full and overflowing the bluff in many places.

In the months of September, October and November the bed of the river would be fairly well filled during that time. There wouldn't be so much overflow except during the equinoctial storms; that would be about the middle of September. I should think the average in the spring months, not counting the deep holes, would be from two and a half to three feet, maybe more, and at times there would be eight and ten feet when the freshet would come down. In the three fall months it would probably be a little less than that, from two to two and a half, possibly three feet.

In the three summer months, June, July and August, that would go down more and probably be less than at any other time. There might be times when it would only be half a foot. There would be places where the gravel and sand was in where you could get across without any water at all. It would be narrowed down to where you could jump across in some of the places. That was in the shallow places that 92 they used to call the fording places.

Q. What was the current reputation as to the early use of the river previous to the time when you first began to know of it?

Objection by counsel for defendant; incompetent, irrelevant and immaterial.

A. I only know as to what I might have heard from the old settlers. I know in those days it was claimed by some of the old settlers that they had come up the river when they came into the county to settle, one in particular, the parents of two of my brothers-in-law. I have heard him tell a number of times how he came up the river in his little boat or canoe, whatever they called it. I think they called them canoes, and he came and brought his belongings and his provisions up there and then went down the river trapping clear down through into the Illinois river.

I have a whole set of the Session Laws from 1833 down, barring a couple of sessions, that is all.

(Witness produces Session Laws of 1839 entitled "Laws of the State of Illinois passed by the Eleventh General As-

sembly at their session, begun and held at Vandalia on the 3rd of December, 1838. Published in pursuance of law. Vandalia, William Walters, public printer, 1839.")

On page 208 appears an Act entitled "An Act declaring the Desplaines river a navigable stream."

Section 1 of the Act is offered in evidence.

Q. Referring to this Act and to the phrase referring to the river "to its utmost limit within this State," can  
93 you tell where that point is?

A. I can. I have been there a good many times, on the state line, between the States of Illinois and Wisconsin. At the state line it was nearly all timber on both sides. The bank is high. Just immediately south of that point, on the west bank it must be twenty feet high. The gorge is probably 100 feet to 75 feet wide there.

I have known this section of the Desplaines river a good many years. When I was connected with the Secretary  
94 of State's office I ran across the original survey of the state line and I took a copy of it, so far as it directly affected Lake County in fixing the state line. I made that while in the office of the Secretary of State upward of twenty years ago.

It is stipulated that the original record of the Commissioners fixing the northern boundary line of the State of Illinois or so much of it as may be needed to fix the northern boundary at the point where the Desplaines crosses the same, or a copy thereof, certified by the official custodian thereof, may be offered in evidence at the trial without further proof.

At the request of counsel for the complainant the witness produces a book, the title page of which reads as follows:

ILLINOIS IN 1837;  
A Sketch  
Descriptive of the  
Situation, Boundaries, Face of the Country,  
Prominent Districts,  
Prairies, Rivers, Minerals, Animals,  
Agricultural Productions,  
Public Lands, Plans of Internal Improvement,  
Manufactures, &c.  
Of The

STATE OF ILLINOIS:

Also

Suggestions to Emigrants,  
Sketches of the Counties, Cities and Principal Towns  
In the State:  
Together with  
A Letter on the Cultivation of the Prairies,  
By the Hon. H. L. Ellsworth.

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PHILADELPHIA:

Published by S. Augustus Mitchell.

And by

Grigg & Elliott, No. 9, N. Fourth Street.

1837.

On the reverse side of the title page is the certificate of copyright and the imprint of the printer, reading as follows:

"Entered according to the Act of Congress, in the year 1837, by S. Augustus Mitchell, in the office of the District Court for the Eastern District of Pennsylvania.

Stereotyped by J. Fagan, Philadelphia."

95 On the outer cover of pasteboard appears the legend:

"Illinois in 1837: With a map."

I own this book and have owned it twenty or twenty-five years.

Counsel for complainant offer in evidence pages as follows:

Objection by defendant's counsel; incompetent, irrelevant and immaterial; no foundation or proof that author had knowledge of facts with which he deals.

COUNSEL FOR COMPLAINANT. I read from the preface, the last two paragraphs on page VII.

"The bulk of the information hereafter detailed is quite recent, being derived in part from the lately pub-

lished and valuable Gazetteer of Illinois, and the Emigrant's Guide by the Rev. J. M. Peck; also, from Flint's Geography and History of the Western States, Beck's Gazetteer of Illinois and Missouri, Schoolcraft's Travels, and the works of Darby, Hall, Long, &c. The work contains, likewise, extracts from different correspondents, and from various gazettes printed in the State, some of them only a few weeks before its publication; particularly the Peoria Register and North-Western Gazetteer, the attention bestowed by the editor of which in distributing recent geographical and local information calculated to be useful to emigrants, renders it undoubtedly the most interesting print of the kind in the state.

The accompanying Map of Illinois is, for its scale, probably the most complete yet published; it contains, it is believed, all the United States surveys available at this time; the whole of the counties, seventy in number, organized in the state; and it will be found, on examination, to correspond with the descriptive part of the book—a desideratum not always found in publications of this kind."

96 Now, on page 28, under the heading "Rivers," I will read the first paragraph:

"It is only necessary to look on the map of this great state, to see what astonishing advantages for inland navigation nature has given it. On its northern borders it has for some distance the waters of Lake Michigan and the various streams that empty into it; and by this vast body of waters a communication is opened with the northern parts of Indiana and Ohio, with New York and Canada. On the northwest frontier it has Rock River, a long beautiful and boatable tributary of the Mississippi. On the whole western front it is washed by the Mississippi, and on its southern by the Ohio. On the east it is bounded by the Wabash. Through its center winds in one direction the Illinois, connecting the Mississippi with Lake Michigan by the Desplaines and by the Chicago rivers; and in another direction the beautiful Kaskaskia flows through the state. Besides these there are great numbers of boatable streams penetrating the state in every direction. Such is the intersection of Illinois by these waters, that no settlement in it is far from a point of

boatable communication, whether with Lake Michigan, the Mississippi, the Ohio or the Illinois."

Now, on page 35, beginning with "The principal tributaries of the Illinois river are the Kankakee, Desplaines, Fox," etc., I will read as follows:

"The principal tributaries of the Illinois river are the Kankakee, Desplaines, Fox, Spoon and Sangamon rivers. These are all considerable streams, and are, after the Illinois, Kaskaskia and Rock river, the most important in the state.

97 The Kankakee, or Theakiki, is the eastern head branch of the Illinois. It rises in the northeast part of the State of Indiana, two or three miles from the south bend of St. Joseph's river, from whence running in a westerly and northwesterly direction through the northwestern part of Illinois, it unites with the Desplaines and forms the Illinois, forty miles above the mouth of Fox river. The Kankakee has a course of about 150 miles, and is upwards of 200 yards wide at its mouth. The prairie county through which it passes is generally of good soil. This river was discovered at an early period by the French, and was one of the principal routes used by them in passing to the Mississippi. Navigation for small craft can be effected, in high stages of the water, from the St. Joseph's river into the Kankakee. The latter, for the first fifty miles of its course, flows through an extensive swamp."

And the first paragraph on the top of page 36:

"The Desplaines river is the northern head branch of the Illinois. It rises in Wisconsin territory, a few miles west of the Town of Racine, on Lake Michigan, and flowing through the north part of the state, it joins the Kankakee at the boundary line between La Salle and Will Counties, where they form the Illinois river. The Desplaines, in its course of 150 miles, runs generally over a bed of limestone. The country along its borders is populating rapidly, notwithstanding the apparent deficiency of timber. About forty-two miles above the mouth of this stream is a swamp connecting it with the Chicago river, through which boats of some burden have often been navigated into Lake Michigan. This route was used by the traders as a medium of communication between the great lakes and the Mississippi, from the first dis-

covery of the country by Europeans;—the circumstance first suggested the idea of an artificial connection by means of a canal at this point. In the bed of the Desplaines, about forty rods above its junction with the Kankakee there is a fossil tree, of a very considerable size. It is a species of phytolites, and is embedded in a horizontal position in a stratum of newer floetz sandstone, of a gray colour and close grained. There are fifty-one feet six inches of the trunk visible. It is eighteen inches in diameter."

COUNSEL FOR COMPLAINANT. The above book contains a map of Illinois, with the certificate at the top, "Mitchell's Map of Illinois, Exhibiting its Internal Improvements, Counties, Towns, Roads, &c. Philadelphia: Published by S. A. Mitchell, 1838." It represents the Desplaines river, Mud Lake; just below Mud Lake the Town of Desplaines; below that the Town of Keepotaw, below that the Town of Lockport, below that the Town of Joliet, below that, just opposite the mouth of the Kankakee, the Town of Dresden, and in the point of land made by the confluence of the Desplaines and the Kankakee, the Town of Kankakee. I am reading this in evidence, and with the verification of counsel for the defendant, who approves of the reading as correct.

COUNSEL FOR DEFENDANT. That is correct.

98 Q. Mr. Heydecker, you produce another volume, the title page of which is as follows:

The  
Encyclopedia  
of  
GEOGRAPHY  
Comprising a  
Complete Description of the Earth  
Physical, Statistical, Civil and Political;  
Exhibiting its Relation to the Heavenly Bodies,  
Its Physical Structure,  
The Natural History of Each Country,  
And the Industry, Commerce, Political Institutions,  
And Civil and Social State  
of  
All Nations.

---

By Hugh Murray, F. R. S. E.  
Astronomy, &c. by Prof. Wallace :Botany, &c. by Professor  
Geology, &c. by Prof. Jameson, :Hooker.  
:Zoology, &c. by W. Swain-  
:son, Esq.

---

Illustrated by Eighty-two Maps.  
And about Eleven Hundred other Engravings on Wood,  
Representing the Most Remarkable Objects of Nature and Art  
In every region of the Globe  
Together with a  
New Map of the United States.

---

Revised with Additions  
By Thomas G. Bradford.

---

In Three Volumes.  
Vol. III.

---

Philadelphia.  
Blanchard and Lea  
1853.

On the reverse side of the title page is the certificate of  
copyright and the imprint of the printer reading as follows:  
"Entered according to the Act of Congress in the year  
eighteen hundred and thirty-six by Carey, Lea and Blanchard,  
in the Clerk's office of the District Court for the Eastern Dis-  
trict of Pennsylvania.

Stereotyped by J. Fagan.

Printed by T. K. and P. G. Collins.



COUNSEL FOR COMPLAINANT. And on page V of Volume 1 of said Encyclopedia, is the advertisement of the American Edition, which reads as follows:

ADVERTISEMENT TO THE AMERICAN EDITION.

99 "The object and plan of the Encyclopedia of Geography have been very fully set forth in the Preface of the English Edition, and the names of the editor and his collaborators are sufficient vouchers for its value. It is due, however, to the American reader, to inform him in what respects these volumes differ from the original. The whole of the English work is here given, with the single exception, that the description of Great Britain, which occupied more than one-third of the Book devoted to Europe, and considerably more than the space given to the whole of America, has been somewhat abridged; but, it is believed, without the omission of anything of importance. The text has been carefully revised and corrected throughout, and in most cases more recent, statistical details have been substituted for those of the original. The additions to the first volumes are not considerable in amount, but are generally such as have been required by changes in our knowledge or in the conditions of things. The Book relating to America has been enlarged as far as the limits of the work would allow, principally by the addition of local details; the condition of the new American states is too unsettled to render it worth while to fill much space with account of their political relations, which might be entirely changed before these pages met the eye of the trader. The chapter which treats of the United States has been written anew, the original being extremely imperfect and incorrect, as all European treatises on the subject are. Our growth is so rapid, the increase of our population, wealth, commerce, manufactures and other industrial resources so amazing, the creation of new towns, cities, nay, states, is continually making such a change in the face of things, public works are conceived, planned and executed on so great a scale and with such promptitude, that it is not at all surprising that a distant writer should be entirely baffled in his attempts to describe the country as it is. The Zoological section alone has been retained, but it has been much enlarged, chiefly from a later work of Mr. Swainson's and some general remarks upon the shells

of the United States have been added. For the account of the Geology of our country, the reader is indebted to Prof. Rogers, of the University of Pennsylvania. The Botanical section has also been prepared by a gentleman of high reputation in the scientific world. The Editor is painfully sensible of the imperfections of the other parts of this Chapter, but he trusts that the difficulties of the subject will obtain for him the indulgence of the reader.

Philadelphia, October 1st, 1836."

COUNSEL FOR COMPLAINANT. Similarly as this is the property of the witness, and is a rare book which we ought not to ask the witness to part with, I shall offer and read in evidence beginning with the first paragraph under the heading, "3. State of Illinois," on page 562, and containing to the end of the same paragraph on page 563.

COUNSEL FOR DEFENDANT. I shall object to it on the ground that it is incompetent, irrelevant and immaterial.

COUNSEL FOR COMPLAINANT. I will read as follows:

"The rich and highly favoured tract of country extends from 37 degrees to 43 degrees 30 minutes N. lat., and from 87 degrees to 91 degrees 30 minute W. lon. Its extreme length is 380 miles; its breadth in the North is about 140 miles, but it extends to 220 miles in the center, whence it contracts toward the South to a narrow point. The land area is 55,000 square miles. Illinois has Wisconsin Territory on the North, Lake Michigan, Indiana and Kentucky on the East and Missouri and Wisconsin on the west; it has a lake coast of about 60 miles; the Mississippi forms the western boundary through a distance of 550 miles; the Ohio is its southern boundary through 140 miles, and on the east it has the Wabash for 150 miles. The interior is penetrated by noble rivers affording extensive advantages for inland navigation. The little Vermillion, Embarras and little Wabash are the principal tributaries of the Wabash from Illinois. The Illinois, the principal river of the State, is formed in the northeastern part of the junction of the Kankakee and the Desplaines, and flows, by a southerly course of 300 miles, to the Mississippi. For the distance of nearly 50 miles in the upper part of its course, there are obstructions to its navigation in a low stage of water, and the rapids above the mouth of the Vermillion River can

be passed only in times of flood. Below this steamboats of moderate burthen find no impediment through a distance of 260 miles. 'The current through the distance last mentioned is exceedingly gentle, often quite imperceptible; indeed this part of the river may with much propriety be denominated an extended pool of stagnant water.' (Long's Expedition to the St. Peter's river.) The Illinois has been well described as a natural canal, flowing through natural meadows. In high floods the Illinois overflows its banks, and the Mississippi, in a high stage of water, backs up the river to a distance of seventy miles from its mouth. In some places it expands to such a width as to receive the name of Lake; such an expansion is Lake Peoria, about twenty miles in length. The Kankakee arises in Indiana near the St. Joseph's, and boats pass in the wet season from the channel of one river to that of the other. The Desplaines rises in Wisconsin, and runs for some distance parallel to the shore of the Lake Michigan, and not more than ten miles from  
 101 the lake, with which there is a natural navigable communication, through which loaded boats often pass during the spring floods. The Fox River is a large stream which rises in Wisconsin, but there are rapids a few miles from its mouth. The Vermillion is a fine mill stream; the Spoon River and the Sangamon are navigable streams. The Rock River is a large tributary of the Mississippi, rising in Wisconsin; it is navigable for some distance, but in low water the navigation is impeded by several rapids not far from its mouth. The Kaskaskia rises near the centre of the State and reaches the Mississippi in a southwesterly course of about 400 miles; it passes through a fine country and is navigable for some distance."

#### *Heydecker Cross-Examination.*

The only dam on the Desplaines river in Lake County is the one I spoke of at the Vincent or Struckmann mill. That was there at my earliest recollection. It stretched clear across the channel and caused the water to flow back, but in high water the water would flow back for half a mile east of it and around the dam and mill pond.

The width of the water from water's edge to water's  
 102 edge at the State line would be probably 75 to 100 feet. Further down it got up to 150 feet. At high water times

it would be half a mile wide, and at dryer times, at midsummer, it would narrow down from that. The average depth during the winter months, judging of the stream that we used to skate on, was from two and a half to three feet. It would be iced over that much. There are not any rapids or riffles in the river through Lake County. I think in some of the places they say the current is as slow as three miles an hour. Some of it was more rapid than that. There was nothing that you would call rapids of any kind. There was fording places wherein the summer there would be above it a great big hole where the gravel and sand was washed out, and a little above would be a bend in the river, and we used to call them in the summer time a swimming hole.

There would be almost no water running. During those  
103 seasons there would be times when you couldn't float anything on it at places.

That would not be so the greater part of the summer months. It would be maybe a couple of weeks in August, or maybe a part of August when the dry time would come.

Over those shallow fording places there would be times when there would be from 6 inches to 2 inches of water, and sometimes I have seen some of the fording places dry. I have seen the logs floated down to this mill. I have seen them in the dam above the mill. They would probably come from anywheres in the Libertyville woods or the Deerfield woods or the Vernon woods, probably five or six miles above the dam. The people who did have them sawed them into posts and fence boards down there. I have seen them in the mill pond and in the river. I never saw logs hauled there to the mill pond by teams. I wouldn't be there that season when they would be hauling logs, but there probably was. I couldn't say whether there were 500 feet or 5,000 feet of logs floated down there. I think there was more than 500 all right. Lemuel Short told me he came up the river in a canoe, and the woman we used to call old mother Miller, the wife of Jacob Miller, who died in California. I knew them personally. Mrs. Miller would tell of her experience coming from Virginia and being in Fort Dearborn during the Black Hawk War.

104 They came out in 1834. I knew Mr. Short personally.

Two of my sisters married two of his boys. They told us about coming up the river from Chicago in canoes. Short came up from Grundy County. He died down near Coal City. He came in 1835. Another uncle, Emory, came here

from '35 to '37. Mrs. Miller came up here in 1834. I heard them tell it several different times and it would be told in different language every time. I have heard Short tell about his coming up, that he started from down in Grundy County where he had a large amount of land near Coal City. He bought that and afterwards married down there. He came up before the land was surveyed in Lake County,—that would be in 1839—and located some land up there, took it from the Government, and that when he came up he brought up all of his belongings, his clothing, some provisions, his guns and dogs and tent with him up the river. He called it "coming from down the river down in Grundy County." I don't remember of his naming any place it was. They had a home—farm, down there and he had up here about 400 acres of land that they located on. I don't know anything about 105 there being seven or eight dams in the Desplaines river at that time; I was never down there at that time. I did not hear him tell of coming over any dams. There wasn't any dams there when he came up, that is, I never heard him tell of coming over any. I have heard of trappers tell of coming through the dams. I have heard him say it was difficult to go up through part of it on account of rocks. I don't remember hearing him say how he got around any dams. He didn't say that he carried the boat most of the way, because if he did he wouldn't say that he came up in the boat. He died about ten years ago in Coal City. Mrs. Miller died since I went away from the farm—she must be dead twenty or twenty-five years. They came here, as she tells it, they came out from Chicago, up the Desplaines river, and he built the first mill on Mill creek. The creek ran out just a little below Wadsworth. The Millers built the first mill in this territory, before the Vincent mill, sometimes called the Kinnicut mill. Mrs. Miller said she came up from some point west of Chicago; of course I was not old enough to go up there very early myself; the neighbors used to tell about the folks coming up the river who came in here and settled on a farm adjoining father; father took our farm from the Government and they settled, they came up in 1836 or '37. That was James Emory.

I understood from their description that these two families, Short and Miller, came into the country for their perma-

ment establishment here by boat on the Desplaines river, and they went back down the river, trapping several seasons after that, came down in the fall and went back in the spring. Emory didn't bring his household property that way the first time. He stayed one winter and then he went back to New York State where he came from and got his wife and they came through that time in a prairie schooner.

*Re-cross Examination.*

I don't think they had any wagons at the time that Mr. Short came up the river. I don't think he had any wagon. He got property down there after he bought up here. He got a lot of canal lands.

All I can tell you is what the folks tell. Whether he could have done it or did do it I don't know. I wouldn't name  
107 any place. I have no recollection of his ever saying Morris or Joliet or any place, but from down there he came up the river. It may be that he came up from some point in Cook County. It may be that he got on at Wadsworth and went six miles further up the river. I don't know. It is my impression, left on my mind as an old story of the neighborhood.

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108 J. H. HILLEBRAND, a witness for complainant, testified as follows:

*Direct Examination.*

My name is J. H. Hillebrand. I am 52 years old. My residence is Chicago; it has been my residence for about 32 years. I am chief draftsman for the Sanitary District of Chicago. I have been employed in the Sanitary District of Chicago's offices in one way or another, for about 17½ years. Before I went with the Sanitary District of Chicago, I worked as civil engineer, railroad engineer and surveyor. I have been a surveyor and civil engineer, I guess about 30 years. To state in a general way some of my duties as chief draftsman of the Sanitary District, I would say that I take charge of all the surveys, plats and maps, the men employed platting the surveys, and I verify and examine and correct the plattings and mappings of the surveys. That work is all done under the supervision and direction of the chief draftsman.



He is the man to whom the Sanitary District of Chicago looks for its correct maps, plats and profiles. I have held the position of chief draftsman for about 13 years.

The map and profile which is before me, which the reporter has marked for identification Hillebrand's Exhibit 1, is a contour map from Chicago to Lake Joliet, giving the location of the main channel of the Sanitary District or Sanitary Canal, the Desplaines river and the Illinois & Michigan Canal, and also a profile of the main channel, and a profile of the Desplaines river. Those lie respectively, in three bands extending lengthwise, crossing the map. The strip marked on the upper portion of the map and extending almost all the way across it in yellow, is the Illinois & Michigan Canal. This map and plat was made under my direction and supervision while in the employ of the Sanitary District of Chicago. The sources from which the information is assembled, which is here portrayed, were from surveys of the Sanitary District. It shows the facts and matters with which it appears to deal, and which it appears to portray and represent, as correct as it can be done on a small scale.

Another mark or strip extending along the greater portion of the upper basin, which is marked in red, represents the main channel, of the Sanitary District of Chicago.

Another band also extending across the main portion of the map on the upper part, which is colored green, represents the Desplaines river, according to the original survey, existing before we built our river diversion. On the east end of it the part labelled in green "West fork of south branch," and again "south branch Chicago River," is the Chicago river and its branches.

Between the parts about at that point where the words "Ogden dam," occurs at one and a considerable distance to the right from that a narrow strip in green labelled 110 "Ogden ditch," is a ditch that had been in existence for years, and which connects the overflow waters of the Desplaines river with the Chicago river.

Along the map at intervals connecting parts of the green band labelled "Desplaines River," a strip put in in black, which is labelled in one place "river diversion," is what we call the river diversion, where we had to divert the river from its original bed. By we, I mean the Sanitary District of Chicago. I mean the work done by the Sanitary District of



Chicago, that diverted the course of the Desplaines river, and laid out a new channel for it. The Desplaines river now runs along that new channel partly and partly in the old channel.

When we built a new channel, the water filled the new channel entirely, and where we did not build a new channel, it filled the old channel, all of the water.

The course of the old channel and the several river diversions taking the place of the old channel where they occur, connect together and make a connected water course and stream from the one end of what is shown on the map to the other, and whenever a new channel has been created and 111 is delineated on the map, the water of the Desplaines river runs through the new channel. The various labels and legends and written matter set out upon the map correctly explain the portions to which they are attached.

The statement made in the letter press or legend of the map is correct. This map is in general and constant use by the Sanitary District of Chicago in ascertaining distances and locations of different parts of their work. We call it our index map. We have a vast number of smaller maps in greater detail of separate parts of the work. This is the general index or key to our set of maps.

This is what we call a blue line print. We had it done a couple of weeks ago. I had a negative and from the negative we had it made. The negative was taken maybe about six or seven years ago,—I am not positive. It was done under my direction,—long before any matters now in controversy had arisen.

These bands in red, and yellow, and green, and black were originally in blue lines, but they were recently colored in.

The coloring itself, the red, the green, the black, and 112 the yellow were printed in by men yesterday, and I put those on at the request of counsel for complainant in order to bring out with greater distinctness the parts so colored.

The work of making the new channel by the river diversion was the first work by the District, and some of it began in 1892 or 1893. I think it was started before Mr. Randolph had charge, but he completed the work. Bennezette Williams was his predecessor as chief engineer.

As to the contours shown on this blue line print and the location of rivers, etc., the survey was commenced in 1890

and completed in 1895, and the location of the main channel or river diversion was put in in 1898, or 1897. The blue line print, which has the large main label, reading "Sanitary District of Chicago Map and Profiles of Sanitary and Ship Canal of Chicago from Chicago to Joliet, Jan. 1898," shows the conditions that existed in 1898, but they put in this continuation of the main channel from the controlling works at or near Lockport afterwards, down to the upper basin of the

Illinois and Michigan Canal, as shown in red. The upper 113 basin is shown on this map in yellow, just above the word "Joliet." Between the point just to the north of Lockport, broadly colored in black, and the part showing the upper basin below the water power channel of the Sanitary District, has been put in since January, 1898, and is indicated in red. The channel for the waters from the Deep Run, indicated in black, lying just below the red line of the Sanitary District channel, the black line beginning at the section line just to the left of the "L" in Lockport, running down across Section 27 and into and half way across Section 3, is the channel of the Deep Run. The waters of the Deep Run are received by that artificial channel and conveyed so that they are all gathered in the Sanitary District channel below the power house. Along the central portion of the exhibit runs another strip which has in the center of it and near the top of the center of it, the words, "Main Channel" in large letters. That is a profile of the main channel of the Sanitary District of Chicago showing the grade line and the original surface; the grade line is the bottom; the red line extending across from one to the other and labeled "Bottom of Channel" represents the bottom of the channel as it was actually constructed; and the various squares and delineations 114 which appear above represents the surface of the ground and the distance;—the vertical distances, the elevations above and below Chicago datum.

The figures which appear at intervals on the horizontal line above the red bottom line, indicate distances above and below Chicago City datum, and that is represented by the line made up of dashes and dots extending across the maps, labeled "Chicago City Datum;" and the original, "Chicago City Datum is low water mark of Lake Michigan in the year 1847 and is 579.63 feet above the mean tide at New York, according to U. S. lake survey, and 578.56 feet above mean tide of the Gulf of Mexico, Beloxi, Mississippi, according to

the Miss. River Comm.," was taken from the official record of those bodies, respectively, and has been verified by me to be correct.

This central band across the exhibit, has a number of divisions by vertical lines,—one at the extreme right end being marked with a cipher, and then going along 100, 200, 300, 400, and 500, etc., at regular intervals out to 1,500, representing the distance from Chicago. 1,500 means 1,500,000 feet.

The part of the legend on the left hand of the general label, says "Map,"—that refers to the general map, constituting the band, and the exhibit which lies across the top of the exhibit, with the names and sections upon them.

And next to that word the statement appears "2 inches equal one mile." That represents the scale to the user of that part of the map, constituting the upper third, or "Strip No. 1" of the exhibit.

COUNSEL FOR COMPLAINANT. For distinction I mark here, as I speak, the right end of these three main channels: "Strip No. 1," "Strip No. 2" and "Strip No. 3." I said "1,500,000 feet; I meant instead 150,000 feet. Strike off the cipher.

The words immediately below the label last read, "Contour intervals 5 ft.," means the distance, or elevation between each contour is 5 feet. That refers to "Strip No. 1." For instance this contour (indicating) is 40 feet above Chicago datum, indicated by "40." (Witness makes the letter "A" at point indicated.) That is, in Section 25, containing the word "Terminal," next to the Chicago Terminal Railroad, this contour is plus 45. I point to another line in Section 1, and passing over to Section 36, which I mark "B," and I see that is marked "45." The interval between these two is 5 feet, which means there is a slope between these two lines of 5 feet. "40" means 40 feet above Chicago datum, and "45"

45 feet above Chicago datum.

116 Small figures and the same small size style of type, which are scattered about this map on "Strip No. 1" represent elevations above Chicago City datum; and the wandering lines upon which the small figures are marked represent a continuous line of country which is at that elevation; and when you see a line marked 40 you can follow that line as far as it goes, and wherever it goes it represents that the

country at that wandering line is 40 feet above Chicago datum.

The map is divided into small squares in "Strip No. 1" the squares being 2 inches square, and those represent the Government sections. The Range lines and Township lines are marked by the customary surveyor's and map maker's abbreviations.

Turning to "Strip No. 2" on the right of the general label of the exhibit, the words "Profile scale Horizontal 1 inch equals 2,800 feet; vertical equals 6 feet." That legend applied to "Strip No. 2," and also to "Strip No. 3," but not to "Strip No. 1." I adopted a scale so widely different, representing 2,800 feet horizontally by one inch, while vertically representing only 6 feet by an inch, in order to bring out the different elevations of the surfaces. To show the differences of elevation, we had to use a much smaller scale for the vertical than for the horizontal. If we used the same scale for the horizontal as for the vertical, the surface lines would practically be a straight line. These variations, which I seek to bring out by the profile, would be so insignificant as to disappear.

These sharp points, which appear at intervals along the top of the yellow-brown portion of "Strip No. 2," are highways, railways and levees.

As to the places marked "side track" under the word "main" in "Main Channel,"—the throwing up of a ballast road bed for the side track in this case gives an elevation which calls for such an expression. It must have been a spur to an ice house, or something.

117 These parallel horizontal lines running across "Strip No. 2," which seem to be about one-sixth of an inch apart, would represent successively the height of one foot above the one below it.

Across the top of this "Strip No. 2," a row of letters and figures at intervals, which look like letters printed on a little flag, with the initialed end. The extreme right-hand end is "O," and a few inches to the left, over the "C., M. & N. R. R." is "N. O."; and a little further to the left "M. N.," and a little further "L. M.," etc.—representing the contract section. For instance the place where "L. K." appears, as a sort of double flag with a circle around it, is the ending of Section L, and the beginning of Section K.

That is, this work when let out by contract was divided

up into numerous work sections, which were indicated by letters or by figures, and each one of those is here delineated, so that if you want to talk about something happening in Section L this would show you where that was at a glance.

That has nothing to do with the dimensions.

118 Right under the point where 5 and 4 in those section numbers come together, I follow a line right down the top of strip number two to the bottom of strip number two at that point, vertically, and I see at the bottom of it there is an irregular jagged line with cross hatchets showing running along it, and there seems to be a dividing line between some yellow-brown coloring on one side of it and some blue-gray coloring on the other side of it. That is the glacial drift excavation. The glacial drift excavation is represented in brown and the late excavation is represented in gray, then this cross hatch line here would represent the top of the rock. The line which lays along irregularly above the yellow-brown and toward the left hand edge of strip number two above the gray which has a small fringe of yellow at the top of it would be the real surface of the ground.

At places the words "The Desplaines River course" over some blue appears then the yellow will come up above the line which seems to be the water elevation and then blue again. For instance, the elevation of this part of strip number two, which is colored in deep blue and has the words "Desplaines River" above it, is a point there where the main channel intersects the Desplaines River, the original bed of the Desplaines River. It is in Section b on strip number one. I make an x and at the point of that x which occurs in the Surveyor's Section 27, the red line or band, which I have described as representing the Sanitary District channel, lies exactly in the course of the Desplaines River as delineated and painted in the original, there being green on both sides of the red for the Sanitary District channel. Going by the parallel lines which represent feet above datum, the surface of the Desplaines River at that point is represented as about seven and one-half feet above Chicago City datum.

The water in the main channel is supposed to be often 119 up to Chicago datum, which would be seven and one-half feet lower than the delineated surface of the Desplaines River at that point.

The blue at the east end of strip number two represents water in Lake Michigan. The water in the Chicago River is

just under the word "Bridgeport," and next to that to the left is a small pocket of blue labeled "Slip opposite Leavitt street." That blue represents the water in the slip. That is represented as being about one foot above Chicago datum.

Strip number three labeled "River diversion" is a profile of the Desplaines River and river diversion from Summit to the Wire Mill's Dam in Lockport is now called 16th street over here, and there in this strip number three is a pocket of blue labeled "Desplaines River," and then a bit of that yellow-brown projecting above the level of the pocket of blue. The yellow-brown represents the excavation, that is material to be excavated in the river diversion.

The letters upon little flags or target on strip number 120 one designate the section numbers of the different contracting sections of the work as on strip number two. The vertical lines dividing strip number two and strip number three are intended to be continuations substantially of the same set of straight lines, so that the portion between the straight line marked 700 and the straight line marked 800 would be the same as in strip number two and strip number one. The tabular statement of figures which appear in the left hand corner of the exhibit represents the amount of earth and rock excavated and work under construction, and the legend below "Further work contemplated but not contracted for" speaks of about the date of January, 1898. I am not sure it does, it may be a little later than that. The table in the upper left hand corner gives the quantities and the table in the lower left hand corner gives the amount and value. I mean the amount in dollars and cents of contract cost. For instance, between the meridian marked 1,000 on strip number three and the meridian which is not marked, but which is ten spaces to the left of the one marked 1,500 so as to become 1,600, the Desplaines River, the level of which is represented as seven and one-half feet above datum, that 1,000 is represented at twenty feet below datum at 1,600, then in the distance between the meridian 1,000 and the meridian 1,600 would be a fall of twenty-seven feet in the Desplaines River. The surface of the water as shown here would be the actual surface at the time of the survey.

While going from the extreme right hand end from strip number three, which is about 350, to the meridian 1,000, which was the starting point before the Desplaines River appears substantially level, then the twenty-seven and one-



half feet would be the total fall of the river on the entire district represented by strip number three. The jagged mountain peaks showing up above the surface of Exhibit No. 3 are similar exaggerations in order to bring out the small deviations in the level of the surface by means of this large elongated and greatly magnified square, and on the left hand lower end of the exhibit is a sort of continuation of strip number two.

On strip number two the line which would receive the number 1,600 crosses through the word "River" to the left hand of and below Lockport, apparently the water there is represented as being about thirty-two and one-half feet below city datum, while on strip number three if that meridian represents the same thing it is only represented as twenty feet below datum. This is so because at the time there was a wire mills there, the river diversion shows the conditions with the wire mills in. There was a dam at Lockport and the long profile of strip number two shows the improved conditions of the river so that while it represents the same place it represents it at a different time. Strip number two was not taken on the same line as strip number three. 122 Strip number three was taken along the line of the main channel. This road is not exactly opposite Wire Mill's Road on strip number three.

There is no profile of the present condition. Strip number two represents the Desplaines River at meridian 1,600 as being thirty-three and one-half feet below datum and represents the level of the water to be just west of meridian 1,800 where the word "Adams Dam" occurs to be 58.8 feet below datum. That would represent a fall between those two points of the difference of between  $33\frac{1}{2}$  and 58.8. That was the old condition when the Adams Dam was still in existence. The Adams Dam was taken out in about 1899 by the Sanitary District.

I think Mr. E. L. Cooley has a profile showing the elevations of the river or the river up between Lockport and Lake Joliet as it is now.

COUNSEL FOR COMPLAINANT. Well, I will leave that part for the present and ask you if on coming again you can bring a profile which does show?

A. Yes, sir.

Thereupon counsel for complainant offered Hillebrand's Exhibit No. 1, in evidence. (Atlas, p. 3950.)



Objected to on the ground that it is irrelevant, incompetent and immaterial, and on the ground that it was made from a survey that has not been proved to be correct because no sufficient foundation has been made to establish the correctness of the map.

The WITNESS. When the surveys were made, which are here assembled, we had two surveyors in our surveying corps, one of the first was Ericson, the City Engineer, and Schrader, the West Park Engineer. They worked under the Chief Engineer's direction. There was an Assistant Chief Engineer at that time, I think T. T. Johnson was Assistant Chief Engineer, and each of these surveyors had a force of linemen and rodmen, extensionmen and observing men. Our surveying corps would constitute quite a large number of men and each and all of those men enter into surveys which are here assembled and platted. Their work was taken in the regular course of public business in the performance of duty, and their reports, and sometimes drawings, and their books were turned in to me, and this map constitutes an assembling exhibit of the information from all those sources of observation by all those men. The map is taken, relied on, and used by the Sanitary District of Chicago in and about its own business in connection with the work of the district.

*Cross-Examination.*

The green strip leading out of the Chicago River at 124 Bridgeport south towards the Stock Yards is the south fork of the south branch of the Chicago River.

The black line starting off at Ogden's Dam and the Desplaines River and running south to the end of contract Section 2 is the river diversion. It represents a channel that was constructed by the Sanitary District for the purpose of diverting into it the water of the Desplaines River while they were building the main channel of the district. It was parallel to the main channel, and that river diversion ditch or strip took all the water from the Desplaines River and it has ever since flowed there. The reason it was done was because the main channel was running partly through the old bed, the natural bed of the stream, and they could not build the main channel through the natural bed of the stream without taking the water out of it. The distance between Ogden's Dam, the head of that river diversion, and contract

Section 2 is approximately seven miles. The river diversion channel runs down to a point just above Romeo almost continuously with a few slight breaks where the water is allowed to pass into the natural bed of the river and the distance of the whole length of that river diversion strip from Ogden's Dam to Romeo is about eighteen miles.

125 The west end of profile strip number two shows a certain fall in the Desplaines River from the dam at Lockport to what was known as the Adams Dam in Joliet, and that profile shows the condition of the Desplaines River as it existed before the work was done on the Sanitary District channel. The dam at Lockport is not shown on this profile. The point from which I started the fall of the river is about opposite here, 33, and the Adams Dam was about 58, that is, there was a fall of about 25.8 feet in the river from a point in Lockport to the point where the Adams Dam existed in Joliet. The distance between those two points is about four miles.

I said that the old Ogden ditch running from Ogden's Dam in the Desplaines River to the Chicago River was a ditch originally used for the purpose of taking the overflow waters from the Desplaines River and emptying them in the Chicago River, and that was a ditch dug for the purpose of draining that territory through which the ditch runs. I do not know the exact date when the ditch was made. It was started at the time of Mayor Wentworth, though, I think. It is sometimes called the Ogden-Wentworth Ditch. I guess it was about 1845. It is very little used now. It is used occasionally when they overflow from the spillway, the water fills there, took off overflow water from the new spillway built by the district, that is, the overflow water fills the Ogden ditch.

126 I refer to the spillway in the Desplaines River just above the old Ogden's Dam. It ran into the lake, but at present it runs into our channel. It runs out along the length of the Ogden ditch up to a point where the little red line diverts from the Sanitary District channel to the west fork of the south branch and there the water would return from the Ogden ditch and the south branch into the drainage channel.

COUNSEL FOR DEFENDANT. Q. You don't know personally that the surveys from which this map was made are correct?

A. I don't personally know, but, of course, I have sufficient checks in the office.

That is the means by which the accuracy of the survey is verified and determined. I employed those on that map and found it correct.

All of the water of the Desplaines River enters the Sanitary District channel until we get down to what is known as the Bear Trap Dam in Lockport and is represented here by the upper end of a broken-black strip, and from that point down the water of the drainage channel commingles when the Bear Trap Dam is opened, and when the Bear Trap Dam is closed those waters commingle at the upper end of the 127 upper basin, where the yellow-brown and the red band and the black band all come together in the platted territory of Joliet.

So that wherever in that map the Desplaines River is shown in green and is parallel by the black strip representing the river diversion the green strip represents the old bed of the stream in which no water runs now, and they are separated by the canal and embankments, which are represented in various ways on all three of the strips. As I have stated that the scales on strip number one are government sections the top of the map does not represent the north. The north is very nearly on an angle of 45 degrees from a vertical line from the top to the bottom of the map. That is so done in order that by placing the rivers diagonally you get a longer strip of them on the plat.

*Hillebrand,—Direct Exam.—Continued.*

Q. You now produce at my request another map which the commissioners marked "Hillebrand's Exhibit No. 2." Mr. Hillebrand, this Hillebrand's Exhibit No. 2 is labeled "Sanitary District of Chicago map of Joliet and vicinity" with other legends. Was that map made by you in the like manner as in the case of Hillebrand's Exhibit No. 1?

A. Yes, sir.

I had them made in the office under my superintendence. The words "Chicago, Ill., December 22, 1896. Thomas F. Perry, Del." mean that he did the drafting. He was a draftsman working under my direction as Chief Draftsman. Below that a separating line and then again below that the legend "Improvement made where Sanitary District platted March

19, 1907." The drafting and platting of the improvements made by the Sanitary District were also made and platted under my direction and are both shown on this map. March 19, 1907, it was platted. The portion marked "New Channel of Desplaines River," also the notation "Main Channel of Sanitary District of Chicago," the improvement made by the Sanitary District between the upper basin and McDonough Street and the levee embankment east of the Desplaines River.

The part which I have pointed out on the map as being improvement in the upper basin, as well as that showing the main channel of the Sanitary District of Chicago are enclosed in the red lines extending from the extreme right end of the exhibit down to a point shortly to the right of McDonough Street, then at a point above about Jefferson Street there begins a double red line, embraces a brown streak which extends from the left of Jefferson Street and past McDonough Street along the margin of the Desplaines River down Hickory Creek, which is labeled "Levee Embankment."

This exhibit substantially represents the conditions of things at points indicated as they exist today, as they have existed since some time prior to March 19, 1907. At the words "Jefferson Street" is a dotted line on an ark labeled "Dam No. 2." That dam has been removed.

Also near where the lines Wallace Street projects across the Desplaines River a little line marked "Adams Dam." That has also been removed. These dams were removed about 1898 and 1899. They were here in 1896 when the work was originally platted, the survey was made in 1895 and the drawing in 1896. Those dams existed at the time of the 129 survey. Between 1898 and March, 1907, the improvements were made which are delineated within the red lines.

Then there is at this time only one dam across the Desplaines River from above the upper basin down to the mouth of the river and that is Dam No. 1, which is the property of the State of Illinois.

Dam No. 1 as it now exists was reconstructed by the Sanitary District of Chicago under agreement with the Illinois Canal Commissioners and built under a consent decree in a suit between those parties.

In the upper basin just above Dam No. 1 are assembled the waters of the Despiaines, the waters of the main channel of the Sanitary District of Chicago and the waters of the Illi-

nois and Michigan Canal. They all three come into one common stream and basin.

This map is drawn on a scale of 400 feet to the inch, the top of the map is not north. The section line comes there to the east and west. This is the east and west, this side is north and south. I call your attention to the line near the right hand end of the map. That line runs north and south and the line running at right angles to it would be the other section line running east and west.

The waters of the Desplaines River run into the "New channel of Desplaines River." The old channel is indicated on the map in blue marked "Desplaines River."

Q. Suppose, Mr. Hillebrand, you indicate at the extreme right hand end of this exhibit the east boundary line of 130 the Desplaines River channel as it was before the Sanitary District channel was constructed and before the new channel of the Desplaines River was constructed. You put a mark a on the map and there is a firm blue line passing the apex of the a. That indicates the east boundary of the river channel?

A. The east bank.

Q. The east bank of the Desplaines?

A. Yes, sir.

Q. Now similarly mark the west bank of the Desplaines. (Witness marks as instructed.)

Q. You place a mark b and adjoining that is a double line. There are some lines quite close together lying off to the right between the a and the b. What do you indicate where I mark the c?

A. More or less of a bayou of the river.

Q. Now, Mr. Hillebrand, between the a and the b are a multitude of small figures arranged in columns and some of them scattered about. I note several of them between the a and the b. There is a 40 on the line which you marked as the east bank and there are 40.6 and 43.4, 43.7, 43.6. On the east bank of which is marked with the figure 40, and then along through the area of these channels are groups of columns of smaller figures ranging between 30 and 60 apparently in numbers. What do those little figures represent?

A. Soundings taken in the river by indicating the level below Chicago datum.

I think these soundings were taken under the direction of Mr. A. C. Schrader. He was in charge of the survey at

that time for the Sanitary District of Chicago, in 1895. They were taken under the direction of Mr. Schrader by surveyors employed by the Sanitary District of Chicago as a part of the work of the Sanitary District in reference to the construction of this channel down here, and this other work. It was 131 taken in the regular course of business and the reports of these soundings were made to me along with the other field notes and data of the survey for the purpose of platting, and they were checked and verified by the assistants in my office in the manner I have previously described and found to be correct, and then were platted as showing the soundings of the stream.

COUNSEL FOR DEFENDANT. How can you check the correctness of soundings?

A. We can. For instance, if one figure of something varies a great deal from the rest, we could send for a surveyor and ask him the reason. We had the experience, and having some profiles of the river we get an idea of the average elevation, and if the surveyor's report is a great deal different we ask him for an explanation.

He looks over his notes and sometimes a mistake is in the book. If we find it is in the book he resounds or recovers his work. There is a report sent in by the man in charge and, of course, he checks his work and turns it over to me.

COUNSEL FOR DEFENDANT. And that is all the checks you had?

A. Yes.

When they come to do the work here of excavating the channel of the Sanitary District and the new channel through the river they would have occasion to dig into the area and in other ways apply their tools and instruments to the very space where the soundings are delineated and in that way would have occasion to verify the soundings.

Q. You may state whether or not that was actually done?

A. I did not check these.

Q. I did not ask whether you did it but whether that was done in the work?

A. Yes, sir.

132 Q. And whether the quantities of material naturally disclosed any inaccuracies in the soundings?

A. I don't know that this plat was made long before that work was started. This improvement work was done since the plat was made. I did not check the soundings, I simply

showed the outlines. The soundings were on the plat before the new work was done.

I have delineated on the face of the printed plat as it showed in 1896 the work that has been done since 1896 without any reference to the sounding figures. I have gone right over the face of the sounding figures with the outlines showing the new work.

Those outlines showing the new work were put in there in 1907, so that here, for example, to the right of the point "Main channel" occur and a little below is an area in which are a lot of soundings written across it, which is now dry land.

Q. But as conditions existed in 1896 it represented the bed of the Desplaines River?

A. Not all of it.

Q. But where the soundings occur?

A. Yes, sir.

That is wherever there is a source of soundings shown on the white strip between the main channel of the Sanitary District of Chicago and the Illinois and Michigan Canal. It is now dry land, but in 1896 those soundings were in what was then the bed of the Desplaines River. Below Dam No. 1 where are the words "Lock 3" is a very pale blue strip going to the left labeled "Illinois & Michigan Canal." 133 The Illinois and Michigan Canal separates from the common flood of the Desplaines and the Sanitary District of Chicago at that point, that is at Lock No. 5 (instead of Lock No. 3). The lock at that point is at the Jefferson Street bridge. The figures similar to the soundings written on the face of the pale blue strip called the canal, a little to the left of Dam No. 1, and also again to the left below Dam No. 1 in the area marked "lower basin" were soundings all taken back in 1895, and they represented conditions of the bottom of the channel at that time.

In the area between the red lines in the lower basin and in the area colored deep blue for the lower basin here and there are apparent boundary lines which project out into the area on each side show the old bed of the river, islands, etc., as it was before the improvements were made to which I refer. That was the bank of the river as it was shortly prior to December 22, 1896, and the red lines represent the margin of the river as it is today.



Counsel for complainant then offered in evidence Hillebrand's Exhibit No. 2.

Objected to because it has not been shown to be accurate.

The WITNESS. The Sanitary District of Chicago caused this map to be made in the regular course of business at the time I have heretofore indicated and it constitutes a part of its records upon the subjects upon which I here delineate and show, and the Sanitary District makes regular and habitual use of this map as a correct map in its regular course of business in dealing with the territory here shown, and I have already stated that it was made in the same manner and from the same kind of reports turned in to me by surveyors in the employ of the Sanitary District, as I have testified to in regard to Exhibit No. 1.

CLARENCE H. PALMER, a witness for complainant, testified as follows:

*Direct Examination.*

135 My name is Clarence H. Palmer. My age, 40; my business, manager of the Racine Boat Manufacturing Company, Chicago Branch;—that is, a manufacturing branch which is engaged in the manufacture of boats, with the factory at Muskegon, Michigan, and one of the general distributing offices in the City of Chicago, and this Chicago branch is in my charge.

I have been in the business about ten years. I never was in the boat business until I went with that company, as a business. Before that I was in other lines.

Q. Mr. Palmer, are you able to tell us from your knowledge of the trade, of the manufacture and use of boats; when the form of boat which is called the "motor boat" first began to be used in the Middle West,—meaning thereby the states between the Allegheny Mountains and the Missouri River?

A. The term "motor boat" has been applied within the last four years, to what were then just launches.

The term motor boat is applied to a boat that is built for speed more than comfort. It is a boat that is long and narrow, and its whole object is for speed. The term "motor

boat" is taken from the automobile, and is only about four or five years old, as applied to boats, but the launches have been in existence for two or three years prior to the World's Fair of 1893.

136 That is entirely a speed boat, the same as a race-horse.

The launches to which I referred were in use as freight boats. The construction of a launch generally for freight purposes would be a boat, say about 25 feet long, by 6 to 8 feet beam, built heavy, and with a gasoline engine of from five horsepower to 16,—varying according to the current that they wished to go against and the work they have to do; and those would be the smallest,—from that on up to larger sizes,—up to 100 feet long, and say, from 17 to 20 feet beam.

To find the tonnage that a boat would carry, you multiply the length of the boat by the beam and by the depth of the hull, and divide by 95. Take a boat 100 feet long and 20 feet wide, and multiply this together, that gives you 2,000, depth 2, gives you 4,000, divide by 95 and that would give you 42 tons.

A boat of those dimensions would carry that load in addition to carrying its own machinery, and the gasoline by which it is operated and its crew.

137 That boat would be a little out of proportion. A boat of that dimensions would be more than 2 feet in depth of hull.

The draft of the boat and the depth of the hull are two different things. The draft would be the amount of the boat below the water,—that would be 2 feet below the water, and that boat would necessarily be from 4 to 6 feet out of water, so that a boat of that description instead of being 2 feet depth, the hull would be at least 6 or 8 feet, and still draw 2 feet of water and travel on 2 feet of water,—so that you have got to figure on carrying more tonnage.

What is considered draft is from the lowest point of the boat, to about water line, where the water comes on the boat,—that is the draft of the boat. As to where the water line came with reference to the depth of the boat would depend upon the construction of the boat. In the tunnel boat,—the propeller,—there is a tunnel built up into the hull. It is more like the cast of your hand placed like that (indicating), making a dome to keep the propeller in. When the boat is stationary, the propeller is half out of the water. As soon as the propeller is started up with the ma-

chinery, it lifts the water and fills this dome, and then acts the same as if the screw was so many inches under water. For instance, you had a 20-inch screw stationary, the propeller would only draw 10 inches of water, but as soon as the motion begins, why this cavity is filled with water, and she goes the same as if the propeller was more than 20 inches under water.

Those are a line of shallow draft boats, and they were first built in England for use on the River Nile. I don't know as I can give you the date when they were first built. It was prior to the World's Fair. We introduced it in this country, I think somewhere about 1898 or 1899,—I would not be positive. I am manufacturing boats of that type now. The power is generated by gasoline engines.

The gasoline engines are two types: the 2-cycle and 4-cycle. The smaller engines and boats used are generally the 2-cycle type,—that is, up to about 10 or 15 horsepower. The difference between the two engines is: the 2-cycle has an explosion

at every revolution of the fly-wheel; the 4-cycle has an explosion at every other revolution of the fly-wheel. The effect of this explosion in the matter of producing power is that the explosion is a mixture of gasoline and air; that is supposed to be 1 of the gasoline to 8 of air, which gives the best mixture, and this is exploded in the cylinder by an electric spark. That is generated by batteries,—generally storage batteries, or dry batteries, or even dynamos are used on some. This forces the piston down and the momentum of the fly-wheel impels the piston to the top of the cylinder, where it compresses the gas, to the next explosion; and this is continued.

These freight launches and boats are in use all over the country on rivers and lakes, especially on the smaller rivers of the country and on canals.

Relative to the manufacture of steam vessels,—from the time that the freight launches came in, the small gasoline boats have had the greater increase in use, at a ratio of, I should say, pretty near 100 to 1.

In this manufacture and use of the steam vessels, from the time it began, it progressively grew larger, and the use of the steam vessels was made burdensome in the United States by having steam boiler inspection, and a licensed pilot and a licensed steam engineer, examined under the rules of

the Federal Government. These burdens do not apply to freight boats, below 50 feet.

The burden of the machinery and fuel to be carried in the motor freight launch, I don't think takes up 20 per cent. as much room as steam. There would be a net saving of 80 per cent. relatively on the items of machinery and fuel carried.

From my acquaintance with the business and the use of 140 of boats with the coming in of the freight launch and motor boat, there has been a decided increase in the amount of navigation and commerce carried on the internal smaller waters and streams.

Gasoline engines have been adopted by a great many canal boats through the country, that have taken out steam; and also they have taken out steam from some of the smaller freight boats and installed gasoline on the rivers.

The steam turbine engine is a steam engine, which itself revolves with successive discharge of steam from small pipes, —the circular motion taking the place of the reciprocating forward and back motion. The turbine itself has not been put in on the small launches.

Q. That is a matter of the larger craft, as far as you are concerned?

A. Yes, sir.

Cross-examination waived.

The signature and subscribing oath of the foregoing deposition were waived by stipulation of the parties hereto.

JOHN M. SWEENEY, a witness for complainant, testified as follows:

*Direct Examination.*

141 My name is John M. Sweeney. I live in Chicago. My business is mechanical marine engineering. I am interested in the "Outing Boat Company" of Chicago, who build motor boats, in the "Howard Ship Building Company" at Jeffersonville, Indiana, and in some allied properties with that concern and repair plants on the Ohio River. I have been building river boats particularly since about 1876 or '78. Our steamboats have been used generally on the western rivers of the United States, some in South America, some in Mexican rivers, but generally on the western waters; the

waters that flow into the Gulf of Mexico, as they are classified. I think I have built several boats that have gone 142 into the St. John's River in Florida, and some in the Chattahooche River, which flows into the Gulf of Mexico.

I am acquainted with the type of boat known as the "Naphtha Launch." The strictly Naphtha Launch, according to my best recollection was used beginning about 1880. In my answer I am distinguishing between the Naphtha, and present Gasoline Launch. Generally the Naphtha Launches were small motors, displaced or substituted for steam power, or was used in boats where steam power was hardly applicable. The naphtha power later on was improved upon by the Internal Combustion Motor. The Naphtha is not an Internal Combustion Motor, and practically to-day has displaced that. The boats for quite a while on the lagoon in

Jackson Park, until last year, were Naphtha Launches. 143 Several of them are still, although they are now beginning to introduce the Internal Combustion.

The Internal Combustion Motor is a motor where explosive gas or something else is ignited in the cylinder itself. The motor that is used is generally known as an automobile motor. This type of boat came in practically seven years ago from this time, I should say. I am not speaking of the experimental list. I am speaking of the time.

I think the first boat of that kind in Chicago was exhibited in the Auditorium around on Congress street in 1900 by a Detroit firm—Bloomstrom.

From that time to the present time, the Internal Combustion Motor has multiplied very fast. Within that eight-year period, the number of Internal Combustion Motor boats in use, on the best data that is perhaps available or obtainable, reaches about 200,000. There are about 200,000 144 of them now. They are used for all purposes.

The inspection law draws a line between boats of fifteen tons or under that. Boats of over fifteen tons require inspection and licensed officers; boats below fifteen tons do not, unless they are used for purposes of hire or carrying passengers for hire.

The old-fashioned steamboats which were in use in 1880 required a licensed pilot and a licensed engineer, as well as inspection of the steam boilers, where they came under the inspection service. The test which brought them within the inspection service was "a boat propelled, in whole or in part,

by steam operated on navigable waters of the United States." Recently that language has been construed to mean that any boat propelled by motor of any kind, shall be construed as propelled by steam. My impression is that that is an edict of the Department. I do not think it is in the form of a statute, as yet, but they are trying very hard to get it there.

Prior to the making of this ruling, a motor boat did 145 not need to have a licensed engineer, under the navigation law, because the law applied to those boats that "were propelled in whole or in part by steam." The boats that were propelled by internal combustion or gasoline, are not steam vessels. They do not use steam at all.

The cost of inspection itself was not burdensome, but the growing requirements of the Bureau as to outfit and as to the numerous life-saving apparatus and life boats, as applied to the licensing for instance, to a certain extent as applied to boats navigating shallow streams, has been a great factor in diminishing the use of steamboats in those streams. These burdens have not, up until this time, been applied to motor boats and gasoline craft. I think they will from this time on, perhaps.

Well, speaking of the last four or five years, which is 146 the best pulse of what has been taking place on the Ohio River, I should say roughly, without having statistics, but simply as a matter of observation, that there have been four or five, some small, gasoline or internal combustion boats built and put in commission, to one steam-driven craft, and the Ohio River to-day is developing an awful big business along its shores by the use of gasoline boats towing very light barges that can be left at one spot or another, and in that way they use very much smaller fuel than a steamboat could use. The saving in the motor of carrying heavy machinery and fuel enables these motor craft to operate shallower waters, and they are lighter boats, too, generally, lighter draft boats.

I have never built any boats for the Chattahooche that were smaller than 150 feet by about 26 or 28 feet wide. These boats would draw, without any load in them, about 20 or 22 inches. Not evenly, all over, because a boat of that 147 type, if she is drawing 22 inches at her stern, she would probably draw 18 inches forward. A boat of that kind, where you are carrying cotton down the Chattahooche

River would be loaded deep in the vessel, so if the bow, was very much deeper, would be loaded to above five feet. A boat of that character would carry probably 150 tons.

To describe in the normal construction as to length and breadth and depth of hull, as distinguished from the draft of the water, a boat carrying 50 tons, independent of weight, would be probably 100 feet long by 20 feet beam—I am speaking of a steamboat now—she would draw, without any load in her whatever, about 18 inches—from 12 to 18 inches, depending upon how much passenger accommodation. If no passenger accommodation, 12 inches. It would be possible to construct that boat on a 12-inch draft, and a boat of that 148 dimension would carry, for each foot of displacement, 50 or 60 tons; 50 tons, any way.

I do not know of any boats as large as 100 by 20 feet, gasoline driven, that have been put in commission, but I was on a boat the other day which was 85 feet long and 15 feet wide, that was driving light, about 10 inches at the deepest end of it, and her average displacement was probably 8 inches; average draft, I mean. That boat would carry, exclusive of her own weight, about 30 tons to the foot; I mean 30 tons to the foot of displacement; to the foot of immersion; each foot of loading. As I say, that is only approximate, because I have used 60 pounds as the weight of a 149 cubic foot of water. It is really more than that. If

the boat is 85 by 15, there would be 7,500 cubic feet of displacement for each foot of immersion, which in round numbers is  $37\frac{1}{2}$  tons; call it 35 tons. That boat on two foot of water would carry 30 tons; more than that, a little I judge.

With the incoming of these internal combustion motors, commercial navigation upon the shallow draft stream of the interior has increased undoubtedly, particularly if pleasure purposes are included. They are also used for commercial purposes. I know that the steamboat men on the Ohio River are kicking a whole lot about them getting into the short trade. The expense of operation, as compared with steam vessels is perhaps less, considering the adaptability, and I doubt very much whether the fuel consumption itself is less. I think the fuel consumption is in favor still of the steam craft.

150 The installation cost on a motor boat, in small sizes, cannot be compared with the installation cost on a steamboat, because a motor boat is available where the steam



would not be, and I think the converse of that proposition is true, but on the very large sizes the steam installation is the only available one. It is the middle field in which you can make comparison of the cost of installation. A motor boat could be installed on shallow water, where it would not be possible to install a steam vessel. There is a for-  
151 mula for computing the displacement necessary to a given load on a shallow draft stream.

Assuming that a cubic foot of water weighs 60 pounds, as the value which is used in this calculation which I made here a little bit ago, after the boat had furnished its own buoyancy—provided for its own buoyancy, or its own displacement, each cubic foot of water that was displaced further by further immersion, would mean 60 pounds of carrying capacity. If the cross section of the boat, or the cubic displacement of a boat for each inch or each foot is known in cubic feet and cubic inches, it is a little mathematical problem to work that out. If you multiply the length of the breadth and then by the depth making cubic contents, and multiply it by 60 pounds for each cubic foot, it gives you the weight of the water displaced by that much immersion.  
152 That causes that much additional immersion; or to find the reverse proposition, the amount of the boat displaced would give you the weight of the boat itself, without the load.

If a boat had two water lines, one where it was empty, and one near where it was higher, where it was loaded, the length by the breadth multiplied by 60 would give you the number of pounds or load that would be represented by the additional foot of immersion.

A tunnel-built boat, is a term that is applied primarily to a boat designed by Thornycroft in England, for the purpose of applying a propeller wheel, so that it would not extend below the bottom of the boat. It was first done for some of the very shallow draft boats which Thornycroft and Yarrow, and other English firms, built for African rivers, such as the Nile and Zambese. Some of these boats, which were called "Mosquito" boats were as light as 8 inches.

153 They would carry a great deal of freight. They are a very large, wide boat. In place of having a propeller wheel extend below the bottom of the boat, it would set up. The stern of a boat built with a tunnel in it, so that the water would rise as the boat went along, the water being under compression, under the bottom of the boat, would rise

into the tunnel compartment and give the wheel water to act upon. It was put there so that the boat could pass over places without injury to the wheel where she could be floated. It has been applied for use on shallow streams.

There have been two boats of that character built for the Ohio River. One is owned by the government, towing barges. They are Twin Sister boats. The other boat is just completed, not in commission yet.

154 In case of the tow boat, they carry no load except their own fuel, but they are loaded to the capacity of the river, at certain times at least, with fuel so as to carry the maximum of the barges which they tow.

In connection with the Missouri River, I have just completed designs for a couple of steamboats upon the Missouri River to be used between Kansas City and St. Louis. The estimate of the draft of these vessels will not exceed 22 inches at the stern, and 18 inches forward, for the light draft, carrying a displacement of practically 500 tons. The boats themselves are 240 feet long and 44 feet wide, and the boat will carry on her maximum load craft, which would be 8 feet forward and four feet aft, 1,200 tons, in addition to the weight of the boat itself.

155

*Cross-Examination.*

The tunnel boats in use in the United States other than government boats to which I have referred, are confined, so far as my knowledge goes, to small boats. There are several of that kind. There have been in the last four or five years, well I do not know how many, but I know that there have been more or less pleasure boats. Perhaps they have been used, to some extent, commercially. The government boat, that is the tunnel boat, the "Ramsey," of about 26 by 120. The other boat is probably 28 or 30 by 150. In the ordinary motor boat used for commercial purposes, the propeller does not extend below the bottom. I will have to explain that answer, because the boat loaded should be deep at the head,

and in the flat stern boat, particularly, the scheme is to 156 (drawing diagram) that being the water line, this is the top of the boat. Now assuming that the bottom, as is shown there, is parallel with the top of the water, the wheel is above the bottom. That is the practice of the company I am engineer of in building motor boats.

Thereupon it was stipulated that the witness might furnish a blue print which would contain expressly the diagram in accurate form, and when labelled with his initials, the same might be admitted as an exhibit in connection with the witnesses' testimony. Said blue print was received in evidence,

Appendix, p. ....

157 The object of making that diagram is that the bow of the boat goes down in the water very much further than the stern, and that as the propeller wheel is set in the stern, the bottom of it would not be below the bottom of the bow.

I do not mean to say that all boats are constructed in that way, but that is the favorite construction to-day, in what is known as the "Torpedo" stern boat. That is the construction used very largely for commercial purposes. It is the change, and it is really the recent development of all there is in boat construction, that when the boat is being propelled the stern of the boat does not settle.

The wheel is always immersed to its full depth approximately, so it may have a little greater depth than that when the stern, is loaded under, but the loading always intensifies that forward movement where the boat is.

158

*Redirect Examination.*

It is pretty hard for me to say when the tunnel construction came in. It certainly was within the last twenty-five years. We had a congress of engineers here in 1893—World's Fair year. I remember at that congress there was a paper on the tunnel boat. All the engineers were not conversant with it. I remember that the paper went on to describe an experiment that had been made by putting a half inch by three inch gas pipe in the top of the tunnel, and running it up through the deck of the boat in order to determine how much pressure there was in the tunnel, as to how high the water rose in the top. I have the published proceedings of that meeting, but I could not put my finger on them.

159 ROBERT E. ORR, a witness for complainant, testified as follows:

*Direct Examination.*

My name is Robert E. Orr. My business is assistant chief draftsman in the employ of the Sanitary District of Chicago. I have occupied that position since August 4, 1906. I have been in the surveying business since 1880. I am a graduate of the University of Illinois. I have tracings here and part of the records of surveys in the possession of the Canal Commissioners of the State of Illinois, and the document now shown me marked "Orr Exhibit No. 1, April 14," which appears to be a blue print, is a blue print of the index page of plat book No. 2 of the records of the Canal Commissioners office. I found it in the records of the Sanitary District office. I took it down and had the survey attached, which appears here, by John M. Snyder, acting secretary of the Canal Commissioners of the State of Illinois. It is a copy of the general index plat showing the route of the canal and the location of the Desplaines River and its tributaries and the old now abandoned towns of Kankakee, Du Page, Channahon, Joliet, Lockport, and along and touching the Desplaines River as it appears in the original record of the survey of the Canal Commissioners.

160 Thereupon the complainant offered said index plat in evidence. (Appendix, p. -----.)

Objected to as incompetent, irrelevant and immaterial, and no sufficient proof of its correctness.

Referring to the document now produced marked "Orr Exhibit No. 2" is an exact tracing of the index page of plat book No. 2 in the Canal Commissioners office at Lockport. It is a duplicate made by the blue print process of the original.

Orr Exhibit No. 2 when connected with Orr Exhibit No. 1 exhibits a complete showing of the survey for the canal from the beginning of the Illinois and Michigan Canal at Bridgeport down to and beyond the end of the canal in Township 34 Range East, the two joined together where the section lines and township lines show that the Desplaines River is represented as continuous stream. I caused that to be prepared and certified in like manner as Exhibit No. 1.

It represents the recorded survey in the custody of the

Illinois Canal Commissioners and the route of this canal as originally constructed with the old towns bordering along the same, Keepotau, Athens, Desplaines, Harmonville, Summit and Bridgeport. Exhibits Nos. 1 and 2 show the Desplaines River and the canal from the mouth of the Desplaines River up to Summit in Town 38, Range 12 East.

The continuous white line beginning on Exhibit No. 2 at a point called Bridgeport and running diagonally southwest to Summit and then southwest down through and near the river, and then beginning on Exhibit No. 1 in Section 161 25, Township 37, Range 11 East, and running west, southwest, then southerly, and then crossing the river in Joliet and running west by south and west on the north side of the river through Township 34 N., Range 8 East, represents the Illinois and Michigan Canal.

Thereupon complainant offered said Exhibit No. 2 (See Appendix, p. ....) in evidence.

Objected to. No sufficient foundation laid for its authenticity.

Orr Exhibit No. 3 is a blue print copy of the record plat book No. 1 showing the junction of the Desplaines River with the south arm of Mud Lake in Section 12, Township 38, Range 12 East. It is a true copy of the original record in the possession of the Canal Commissioners. I have seen the original record myself, compared every item and every note.

There appears to be a slight jog where the words "outlet of Mud Lake" appear as if the two lines which embrace the words "outlet of Mud Lake" do not quite correspond with the words "south arm of Mud Lake." That is an error in the copying. In the original they do join.

Orr Exhibit No. 4 shows the authorship of those records plat books Nos. 1, 2 and 3 in the State Canal Commissioners office. It is an exact copy of the original. I have personally compared it. The note "This piece of land was once enclosed by a ditch which has since been abandoned and is now a common, June 5, 1847," which appears on the foot of Orr Exhibit No. 4 embraced in a bracket, is an exact copy of the corresponding note on the original.

162 Orr Exhibit No. 5 is a copy of page No. 7 plat book No. 1 of Canal survey of Section 15, Township 37 N., Range 11 East. I have personally compared that with the original and it is a copy as to notations and everything. On the left of said exhibit in the notation "N. B. full lines on

margin of river were run by N. E. walls in 1821 and line of deeds on margin of river on N. E. & S. W. Bayou is the meander L. of the survey of the peninsular of 1846, A. J. M. by order of Gov. Sur. Gen." The initials A. J. M. are those of A. J. Matthewson, the well known surveyor of the canal. I personally compared all of these Orr Exhibits which I have produced with the corresponding originals in the custody of the Canal Commissioners and found them to be exact copies.

Objected to on the grounds already specified. Exhibits 4 and 5 further objected to on the ground that the certificate of John M. Snyder that appears attached thereto is incompetent evidence and ambiguous and uncertain. (Said exhibit appears in the Appendix, p. ....)

Thereupon counsel for complainant explained that there was a vacancy in the office of the Secretary of Commissioners and that John M. Snyder was the acting secretary in the actual custody of the records.

Thereupon complainant offered in evidence from the public volume of Report of the Canal Commissioners of Illinois to Governor John R. Tanner, December 1, 1900, being the official print, Springfield, Illinois, Phillips Bros., State Printers, 1901, the paragraph on page 235 reading as follows:

"The Matthewson Survey of 1847 & 1848 gave the width of the canal and the lines of the reserve the entire length of the canal."

I compared all the figures with the plats in the office of the Canal Commissioners and scaled in a great many places to test them and they do not vary in time more than a fiftieth of an inch so that they are exact copies of those records and I have shown the authorship of them in that affidavit also in this report.

The signatures and subscribing oaths of the foregoing witnesses to their respective depositions were waived by the stipulation of the parties hereto.

164 GEORGE B. FOX, a witness for complainant, testified as follows:

*Direct Examination.*

My name is George B. Fox. I live at Wyoming, Ohio. I am engaged in the manufacture of paper. Wyoming is located in the County of Hamilton, about twelve miles north of the City of Cincinnati. The name of the business concern is known as the Fox Paper Company. The mill is located in Lockland and is adjacent to the Village of Wyoming, 165 through which the Miami and Erie Canal, that runs from the Ohio River to Lake Erie, runs. We make use in our business this canal in the transportation of raw material to the mills and of the finished product from the mills. There are four of our mills that are located on the banks of the Miami Canal. The canal is one of the principal means of transportation by which raw materials are brought in and the product carried out from the mills. I became interested in these mills in the year 1868 and have continued operating them ever since, then continuously since 1868 I have been making use of this waterway to get into the Ohio River for transportation. Steam was used as a method of operating canal boats on that canal on perhaps three or four occasions by other parties and myself since that time, all of which, however, proved to be a failure. When the so- 166 called electric motor, or the Miami and Erie Canal Transportation Company intended to engage in the business of the transportation of boats, they bought up all of the boats they could get hold of and proceeded to lay down a track under a franchise obtained from the state, claiming that they would be able to operate the boats by motor power and succeeded in getting a track laid down from the City of Cincinnati to Dayton before they undertook to do any business, then they began to tow boats with this method and in a few weeks pronounced it a failure. That was by means of a motor running on a railroad track alongside of the canal. It was an ordinary railroad track that was made very heavy and strong, as heavy as any railroad, I guess, operated in Ohio.

But the difficulties in the transmission of the power and the making of the connection and the friction which generate and other causes rendered it impracticable. They themselves admitted that it was a failure for several causes. In the



construction of the track they occupied the towpath which rendered it practically impossible to use horses and mules.

I learned of a new method of propulsion, sought the patentee and arranged with him for the use of his method along the canal from Dayton to Cincinnati. That method 167 was known as the Coen System of Propulsion.

At the trial of the said cause, counsel for complainant offered in evidence a certified copy of the United States Patent No. 733010 for the propulsion of vessels, being the Coen patent referred to by said witness Fox.

Objected to as incompetent, irrelevant and immaterial. Objection overruled, and said document was received in evidence. App. II, p. 3891; Trans., p. 5860; Abst., p. 1725. (For copy of said exhibit see Appendix, p. ....)

An opening is cut into the bottom of the boat of the size, we judge 30 inches wide and about 22 feet long. Over this opening we construct a magazine that was 30 inches in the center and 30 inches wide. From the high point it proceeded down to the bottom of the boat, at the ends it is a semi-cylinder placed at an incline at the bottom of the boat, in the center of which cylinder we placed a 28-inch wall with three flukes, ordinary propulsion wall, and to operate it had a gasoline engine from the outside with a shaft running through the shelf with the ordinary modern combustion gasoline motor. I have a photograph of the first vessel that was operated with this magazine and tunnel. The picture marked "Fox Exhibit 1" is such photograph. It is a photograph of the internal appearance of the first boat that was constructed by the above method. This semi-cylindrical elevation 168 which projects upwards running backwards from the lower right-hand corner of the photograph is the magazine in which the wall was placed. That first boat was constructed and built in the summer of 1903 or '04. I have been using boats of that type in the transportation of the raw material in and of the finished product out of my factory from that time to this. The boat represented in Fox Exhibit No. 1 had a capacity of from 50 to 60 tons. The horse power in this boat was 14 horse power. The boat light and without a load would operate on about 10 inches of water and we 169 could float it down to four feet of water easily if we had the water in the canal, but unfortunately the water had been permitted during the time the electric motor people occupied it to fill up with mud, so that we could not

safely load it to exceed two and one-half feet going up stream, pretty nearly three feet going down stream.

COUNSEL FOR DEFENDANT. I object to that answer and move to strike it out as not responsive to the question because the question was "in what depth of water would the boat float" and the witness answered what the draught of the boat was.

COUNSEL FOR GOVERNMENT. Well, you may state whether or not it was operated in the respective depth of water which you have mentioned.

A. Yes, it was.

When there was 10 inches of water in the canal we could operate the boat. The draught of the boat when it is not loaded is about 9 or 9½ inches. One of the objects of the 170 magazine or tunnel in the bottom of the boat is to enable the propelling wall to operate without making a requirement of additional depth of water with the wall itself. Some of the other objects are to avoid striking a rock or boulder or a tow line back and forth in the shallow water of the canal, and if the wall is about to hit the bank or strike some obstacle and the wall being up in the magazine is far from any object of that kind, and we never have had any trouble excepting when a timber or something that the boat would fasten that would be held in the ground and would fly up. The magazine would not keep the boat from striking the obstructions but would keep the wheel from striking obstructions.

The length of the boat represented in Fox Exhibit No. 1 is 80 feet. Those we built later, I think, are 81 feet and 171 the breadth was 31½ feet. We had them built; some were three, some were four feet high, the hold, and others were 4½, and I think we had one built five feet high. These boats that were built five feet high could all of them operate on 10 inches of water. The actual displacement of them was 9 or 9½ inches. The photograph produced marked "Fox Exhibit No. 2" is the outside appearance of said first boat.

The other boats in appearance, however, are practically the same. It is from the same model except that the length is about a foot longer. I may say that this boat was one that I had built in Buffalo about twenty years prior to the time that the method of propulsion was put in this boat. We 172 had been operating it for about twenty years when the new magazine propeller was put in in 1904. The boat

was first built in Buffalo in 1884 and the type was that of boats in use on the Erie Canal. It was built by the firm of the name of George Notter & Son, who are builders of boats on the Erie Canal but who never built an iron boat until they built this one. This boat is an iron boat. The latter boats are steel.

At the time I had this boat built one of our manufacturers also had a boat built, and about the time that we adopted  
175 this method of construction the parties who operated the other boat had used it pretty roughly and thought it was all worn out and sold it for old scrap. I bought it and put in a new bottom. I figured that it was about as good as new and then put in this method of propulsion in this boat, and after operating it two years I made a contract with a concern in Cincinnati for the construction of six more, all of which were built after this model and completed, arranged for propelling it in the same way as this. During the past summer the state is rebuilding the old lock between Dayton and Cincinnati and we could only at times operate them between certain points when we could get the water in the canal, but we are continually operating these eight boats from Lockland to Cincinnati. This Fox Exhibit No. 1 shows the general lines of the boat and of the magazine propeller which are common to all of the eight boats, with the exception, of course, that the height of the iron works here, is six inches to a foot greater or less than in others. The wooden decks are all the same.

174 The capacity of the boats all run about the same. They are made of uniform size to conform with the construction of the locks, the width and length. This system of propulsion reduces the amount of trouble not from rocks particularly, but from the canal filling up with formation of bars and silt and mud in the bottom of the canal.

We never operated by propulsion before. They were all pulled by horses before that and had trouble at that and that trouble has been greatly reduced by this system.

175 The propeller is about an inch above the level of the bottom of the boat, between an inch and a half to two inches above the bottom of the boat.

We found that when we put the boat in the dock and the machinery in stall that when the water came into the dock air prevented the opening to be filled with water so that it was a mass of air in the air chamber instead of water and the

wheel turns around without even striking water. The advantage of the system is that we have a little air pump and we extract air from the magazine, pump it out and water fills up in a column about six or eight feet high which the inventor claims gives us a pressure of six or eight feet of water on top of the wheel. At any rate we had the wheel sub-176 merged and the force to throw the boat in four inches of water we could have an eight foot pressure according to the claims of the inventor and I don't see why his claim is not correct. It has proven a practicable commercial method of operating freight boats for the transportation of freight to and from my factory. It is much more practicable than the mule principle and much more desirable to operate. We get better hands to work them and if a stream comes or the trip is completed that boat is tied up and we have not a lot of tired or sick mules to take care of or tow lines to buy, and it ends.

Since the operation of these boats the railroad people have started to bump up against us pretty strong and they have since that time made a rate of \$5.00 a car into the city when they used to charge about \$30.00. We ship our stuff by 177 rail at \$5.00 a car when we have a carload, but when we have less than a carload we take it by these boats for perhaps less than half of what they would charge for less than car lots. This \$5.00 rate has taken the place of the \$30.00 rate, which was in force until we installed this system of internal combustion motor boats, and their object and use is entirely the transportation of freight. We have no other use for them and they are in continuous use.

Thereupon complainant offered separately Fox Exhibits Nos. 1 and 2 in evidence in connection with the testimony. (Atlas, pp. 3947-8; Trans., pp. 6563-5; Abst., p. 1924.)

(Said exhibits, Fox No. 1 and No. 2, appear in the Appendix, p. ....)

*Cross-Examination.*

I said these boats drew nine inches of water with no loads in them and that they could operate in ten inches of water now when they had a load such as would make them profitable to operate for commercial purposes. We could not oper- 178 ate them profitably at 15 or 18 or 20 inches, but I believe that we could operate them profitably in two feet of

water in addition to the nine inches draught. We have a trade that we could operate them profitably at less.

Q. What I am trying to get at, Mr. Fox, is how much water would be necessary to operate these particular boats profitably for commercial purposes on that canal?

A. That would be a very difficult matter to answer. We have certain trade that we could operate them profitably at even a trifle less than that, such as what is known as wadding and padding, where we get a very high rate per hundred, in other words, we will load a boat down to 50 tons and 179 down to 2½ to 3 feet, and we may not perhaps get quite so much for a load into the city as when we load it with the wadding and padding where the freight rate is from three to four times more per hundred. There are grades of freight, you know, that you get more for and groceries again coming up are of a light nature, for which we get a low rate.

If they are loaded with heavy matters, such as paper or starch or soap or candles, we could put on from 50 to 60 tons if we have water to float them in. The water required to operate the boat depends on how heavy you are loaded, I should say, about three feet of water with a heavy load. That is not in addition to the 9 inches draught and we could load a boat full of light material and it would probably not go down in the water more than two feet in all.

180 JAMES O. HEYWORTH, a witness on behalf of complainant, testified as follows:

*Direct Examination.*

My name is James O. Heyworth. I was sworn to testify and did testify before the Legislative Committee last December. I was subpoenaed yesterday to appear here this morning, and have come in obedience to the subpoena. The subpoena required me to bring with me the plans and specifications for the dam of the Economy Light & Power Company, in course of construction, in Grundy County, Illinois. I did not bring them with me, because a counsel for the Economy Light & Power Company advised me not to. The counsel was Mr. McKeever. I think it was Mr. Buell McKeever, of the firm of Isham, Lincoln & Beale. So far as I can recollect, this is the subpoena that was served on me.

Said subpoena was thereupon marked Heyworth Exhibit 1 and offered in evidence.

My business is that of a contractor. I have been in 181 that business since 1890. At present I have a contract with the Economy Light & Power Company for doing some work on a dam, in the County of Grundy, near the mouth of the Desplaines river. I have a copy of that contract, with the plan and specification attached, but not with me. It is at my office at Michigan avenue and Harrison street in the City of Chicago. That is where the set of plans are. There is no physical inconvenience about bringing the plans, if I had not been directed not to. The date of the contract is July 15, 1907. I first learned that there was such a piece of work to be done, by receiving an invitation to bid from Daniel M. Meek, consulting engineer, Madison, Wis. I believe he was the consulting engineer of the Economy Light & Power Company at that time. He so held himself out to me. I have not that letter with me. That stated when the bid should be in, but I don't know when. My recollection is it was longer than ten days. I had about four weeks to prepare the bid for it.

I knew of the work before, through Mr. Munroe. I could 182 hardly say I had been in consultation with Mr. Munroe before that, except that he asked me if I would like to bid on the work, and I said I would. That is, Mr. Charles A. Munroe. I knew there were four or five other bidders; I don't know how many. The length of the dam called for by that contract, was in a way problematical; it would depend upon the development of conditions there somewhat. You realize that there were a great many dimensions connected with this power plant. From water's edge to water's edge, I should say it was in the neighborhood of 280 feet. That would be from the lowland. You see the channel in the river is indicated on the map. That would be the width there. That has been changed a good deal though since that (Hillebrand Ex. 3 map was made. Those banks are not now where they were on that map. This side is washed out considerably. By "this side," I mean the south side. I think the eleva-

183 tion of the proposed dam was 77. And that is minus 77 Chicago datum. Without referring to the plans, I could not give the height which the dam would have from the surface of the ground, at the bed or bottom of the river in the center of the river, to the crest of the dam, in feet and inches. It was in the neighborhood of 18 to 22 feet. My best recol-

lection now is that it was about 21 feet. The contract specified a time when the work should be completed, which was September 1, 1908. I can't tell you whether there has been a change in that contract in that respect. There has been in my attitude. Before the Legislative Investigating Committee, I said, "well, I think I have got four or five months' time on it." That was correct as I understood it, that is, from my standpoint. I have had no such intimation from the Economy Light & Power Company, but it would be a claim for delay or extension, which I would expect to substantiate. My testimony was given on the 26th day of December, 1907. I filed a claim or made a statement of my position, demanding additional time. I have written letters explaining the causes of the delay. The letters to which I refer were written before this suit was begun, and had no reference to the injunction suit. I began the actual construction of the dam in the early part of September, as close as I can recollect now. On the 26th of December, 1907, the rock excavation for the power house and the dam was about one-fifth done. I had not at that time begun work on any of the concrete or masonry. I was merely excavating the bed of the river and banks where the power house was to be located. I had at work there in December, about 180 men down to 130; it varied. I think I received notice of the injunction having been issued in this cause, on the 31st of December, 1907, promptly upon its being entered. I couldn't tell whether I did or not. Since then we required a break in the dam, and made other repairs on the old levee, that was there when the work was stopped. That was in the cofferdam and the earthen levee.

The cofferdam is composed of a row of 4-inch sheet piling, with 3 wales opposed about 10 feet away by another row of sheet piling of heavy wales, tied together with tie rods, the same being filled with earth and rock. It was filled with earth and capped or bedded with rock on top, so as to hold down the dam. This would stand a head of water of about 12 feet. It was not completed at the time we had the big flood, and due to an extra amount of water which the drainage board let through the bear trap dam,—to the best of my knowledge and investigation, I would say a part, about 110 feet of the cofferdam running parallel with the level was, forced in and laid on its side, the result of which was a filling up of the outer cofferdam, and later, due to a washing of



the intercepting levee, the filling up of the inner cofferdam too. What I say about action by the Drainage Board in letting an extra amount of water go through the bear trap  
187 dam, is the result of an investigation that I made during the time of its action. I found some extra water and I made some inquiries and reached that determination of the matter, that that was what caused it.

(Counsel for complainant moved to exclude from the answer of the witness, the opinion and conclusion as to the causes.)

Q. Describe what was done thereafter at this work?

Objected to as immaterial.

A. We repaired the cofferdam referred to, replacing it in about the same condition as it was prior to the accident, also repaired the earthen intercepting levee, and two upstream and downstream levees, which had been cut up by the flow of water, and took our machinery equipment and tools out of the cofferdam pits, and placed them on high ground for storage. The work to repair the cofferdam and levee was done with a very small force of men. It took about 45 days. It

could have been done with the force of men we had there  
188 at the time of the accident in about a week. We had from

8 to 25 men at work on it. The cofferdam was reconstructed by me, was about the same as before the break, except that we left out the inner row of sheet piling. It was neither higher nor lower than it was before; practically the same; it may have been an inch or two, something like that, but it was practically the same type dam as it was before.

Q. Was there anything else that you did upon that work or that was done by the contracting force or by anybody form that time to this?

Objected to.

A. There was some work done on the levee at the Smith bridge just above Channahon. A levee is a barrier composed of earth or other suitable material, which is raised above the natural elevation of the ground, for the purpose of either impounding water, or keeping the water from overflowing other territory than that confined by the levee.

189 The levees referred to, near the mouth of the Desplaines river, are temporary levees erected for the purpose of prosecuting the work. They are in the nature of a cofferdam made of dirt. I refer to none of the permanent levees when I speak of the levees at the site of the work. Two of those

levees are at right angles with the course of the stream, and one of them is parallel with the course of the stream.

Q. What did you do to the levees which were at right angles to the course of the stream at any time since the happening of that wreck?

Objected to; immaterial.

A. Some of the levees which are at right angles with the course of the stream, had a flow of water over the top, which caused a cut and washed out some of the top of these levees. This was refilled with dirt, and some rock was placed on the top of those earthen levees, so as to hold the dirt as far as possible against future floods. Its condition, after I had caused that work to be done, was practically the same as was its condition immediately prior to the break, with the exception that it had a little more rock on it afterwards than it had before. We made some parts of it stronger when we were repairing it, than they had been prior to the break. There is a great deal of it that is practically the same as it was before the break. We hardly went to the extreme of making it enough stronger than it was before, to avoid possibly a repetition of that experience. We repaired the break with a small force, and tried to make it as good as we could without much planning for the future. I was cutting 190 things down as economically as I could at that time. We always hope when we fix a levee, to make it somewhat stronger than it was before; but we cannot tell. We had no definite plans of strengthening that levee; that is, no broad plan of making it a different size or stronger levee. We simply repaired the breaks in it, that is all we did. A cut sometimes has to be strengthened with rock, where an original levee don't need that rock. It is a new fill and it is soft and has got to be protected with rock. I don't think the levee there to-day is as strong as it was when the injunction was served. As a rule, a repaired levee is not quite as strong as the original levee. The initial strength of an unbroken levee is somewhat greater than that of a repaired levee. We didn't plan any such strengthening, as that of resisting any similar flood. I had a very small gang of men there, and we tried to hold it down with as small an expense as we could. The coffers and levees have since been repeatedly injured by the natural floods. A very high flood is not as dangerous as a flood that just tops it. We have repeatedly had floods that were considerably higher than the one which made the break.

Those floods do not give one-fourth of the trouble that a flood that has got just about to the top of your work, does. It was one of the heavy floods of that season of the year. An unusually heavy flood for December as far as I could gain from 191 talking to the river men and inhabitants down there. Including December my recollection is that the total estimate for the work on this contract was about \$36,000, which, after deducting 15 per cent., would give us the amount of money that was estimated to me on January 1st. That would be \$30,000. That includes part of the regular contract work in the month of December. I did not get my pay for December work until along about the 5th or 10th of January, and I had not received that pay at that time. I had the estimate made out before I got the money. I think about \$22,000 had been paid me on the 31st of December. I have so many of those estimates I can't remember.

Under the advice of the counsel heretofore referred to, I still refuse to produce the contract plans and specifications for the construction of this dam. It is not on account of any reason or interest of my own that I refuse to produce the plans, specifications and contract, but simply because of the advice of counsel for defendant that I have referred to.

*Cross-Examination.*

192 To the best of my recollection, Mr. Munroe first conferred with me, with reference to this proposed work, about four or five weeks before the work was let. I had some talk with Mr. Munroe about his purpose of building a dam and a power house on the river, I should think, about five years ago. At that time he talked with me with a view of my possibly bidding upon the contract for that work. I commenced getting my material ready for this work at Dresden Heights the latter part of July, and the first part of August, 1907. I assembled some material there before the contract between me and the Economy Light & Power Company, was signed. I had been advised that my bid was accepted before the formal contract was signed. I then began getting my material ready at the ground. In the statement I have made or the testimony I have given, as to the amount which had been paid me, or estimates given me for the work, nothing was included for the cost of my plant, assembling my material there, and erecting my houses and preparing for the

work. The cost that I was put to in that particular on this contract, was about \$110,000 or \$115,000. I have a number of houses there now, and a considerable amount of machinery. I had certain sub-contractors on this contract.

Work has been done by the sub-contractors in addition to my work at the time this injunction notice was served.

Q. What was the work that had been done under your contract or sub-contract, in addition to what you have already mentioned?

Counsel for complainant objected to the question as irrelevant, incompetent and immaterial, and not proper cross-examination.

It was thereupon agreed by stipulation that the objection might stand to each question asked.

A. The contractor for the levee for the Riley Creek diversion had assembled and erected his machinery to do this work. He had it already to begin within a few days of the time of the injunction. The contractor for the levee at what is called the Smith's bridge levee, above Channahon, had also assembled his graders, teams, outfit, etc., and had done some work on that.

That Smith's bridge work is about 4 or 5 miles above the point where the dam is being erected, I should think. The Smith's bridge levee is a permanent levee. On that levee, at the time the injunction was served, I should say about 12,000 to 15,000 yards' work had been done. The levees that I repaired after the flood were in the bed of the river, that a 4 or 5 foot rise would submerge; not under water when the river was at its low water mark. No work had been done on the levee intended for the Riley Creek diversion, prior to the injunction, except assembling, and erection of the plant to do that. A concrete core wall for a levee was made before the injunction, but no concrete for the power house or dam or plant, as the question was put to me before. This core wall concrete was a short piece of wall, about 6 feet high, 3 feet base and about 80 feet long.

Q. Was that located upon the tract reserved for a government lock?

Counsel for complainant objected to the question, as assuming a state of facts to exist and to be in evidence, whereas, there is no evidence that any such state of facts does exist, and because the same is irrelevant, incompetent and immaterial, and not cross-examination, in any point of view.

A. This core wall of concrete was placed in the levee and dam, which was to connect the canal levee with the proposed power house, so as to make the dam watertight. This dam was placed in this position between the levee and the canal and the power house, composed of dirt, as I understood it, so that the same could be readily removed at any time.

It was so placed for the purpose of the installation. For the purpose of the erection of a lock at this point. That would be, referring to Hillebrandt Exhibit 3, at the right hand side of the river going down, and at the end of the proposed dam. The purpose of the core wall that I refer to, was to prevent water following the course of the bed rock underneath the surface and undermining this dam. The portion that I refer to as having been built of earth could be 195 very readily and very quickly removed by steam shovels.

That work was made of that character under the direction of the Economy Light & Power Company. At the time the injunction was served, the earthen dam part was completed; the up-stream side had been riprapped to the rock. It was practically ready for the service for which it was intended. The connections provided for the towpath bank had been completed at the time of the injunction. With the exception that the towpath was to be raised some 2 feet, that was the only connection to be made with the towpath on the plans. About 1,000 feet of the work of raising the towpath, had been completed at the time of the injunction. It had been raised 2 feet, under the supervision of Mr. Mead, represented by Mr. Woermann, the Dresden engineer. The Canal Commissioners were represented in this towpath matter.

The canal superintendent was down there and consulted with us and we with him, and finally we put it in according to his directions.

Counsel for complainant objected to the last answer specifically as being a conclusion and opinion of the witness, and embracing transactions and conversation and directions between the witness and this other party, and that it is not the best evidence, and also as irrelevant, incompetent and immaterial.

The plans for this work are not physically attached to the contract between myself and the Economy Light & Power Company. The earthen dam or embankment that abuts upon the towpath is now about 90 feet wide, or the proposed width, I think, is 96 feet; it is now about 75 or 80 feet wide, ready for its junction to the masonry as soon as that is completed.

That was so at the date of serving the injunction. The specifications are physically attached to the contract, but the plans are not.

*Re-direct Examination.*

In the center of the river at the point where the dam would come, before I did anything at low water, it was about 4 or 5 feet deep. It is now about the same. I don't know what the depth is today. At the time we got our coffer and levee in, we had about 16 feet of water. It was considerably deeper at these various floods I have referred to. The country down there is to a considerable extent rather flat on one side. It is high on the right hand side, and it is low on the left hand side. I haven't myself seen the bottom of the river. We took the soundings that were made by the representatives of the Economy Light & Power Company people, and we made a few ourselves, but could not determine by those the character of the bottom, except that it was about, on an average, 4 or 5 feet deep. There were some boulders in it and some rocks. At low water that was all covered throughout the width of the stream.

The canal superintendent that I referred to was a Mr. Keough; he is now dead. Mr. McDonald, I think, was the last man along there. Mr. Keough, as well as Mr. McDonald was there; they talked with my superintendent. Whatever direction or conversation of that kind occurred, occurred between Keough, or Keough and McDonald and my superintendent. It did not occur directly with me. My orders to my superintendent were to see them and have them approve the fill that we were putting on the canal levee towpath.

(Counsel for complainant thereupon moved to strike out all reference to the witness' orders, through his superintendent, and to the conversations by the superintendent, as being transactions of which the witness does not have personal knowledge, and as not being the best evidence.)

198 I say the work, on the connection of that dam with the towpath, and the raising and filling of the towpath for a thousand feet back up-stream before the connection, is completed.

*Re-cross Examination.*

The character of the rock that I excavated from the cofferdam, was a sandstone, also a soapstone, also a soap sandstone, also a bastard sandstone, some iron in it.

*Re-re-direct Examination.*

That is not what is ordinarily geologically called sandstone shale. There was shale stratas of it. There were also stratas of sandstone and stratas of soapstone. I have told you all I know about that sandstone. It was probably formed there in the same manner as it is formed in the other deposits found in the country with the exception that the top of this sandstone was subject to severe glacial drifts, and I think the action of the receding waters and sun caused the shale, caused it to disintegrate to a certain extent. If the same influences would be continuous, it was a continuous process; and there was some evidence of clay, which undoubtedly formed the soapstone. As to whether it was the customary, normal sandstone and shale which overlies the coal measures, and belongs to the coal measure period, it was not quite as deep as you find that. You take it in Alabama in the Birmingham district, and you will find the shale limestone, that is down lower in the river in what they call the foot hill district, which runs 3 or 4 and 5 feet deep. This shale seemed to be very shallow, and was superficial in that respect. This sandstone shale is not the same as I have found in Louisiana and Alabama or Indiana; it was much shallower in depth. It seemed to have been caused more by the water than by any upheavals, as the other sandstone fields, to which I have referred, seemed to have been caused by the upheavals or action of the heat and the ground.

I mean to convey the idea that in the recession of the waters from the higher points to the valleys and the lower points, the loose material will follow the drainage; naturally our shed is toward the Mississippi river here, and the evidence is, and the valleys of that district show that a glacial drift had drained off through that way and had lodged and been left there by the receding water.



201 ROBERT E. ORR, a witness called on behalf of complainant, testified as follows:

*Direct Examination.*

Q. I believe Orr Exhibit 3 has already been put in evidence. I direct your attention, Mr. Orr, upon this Orr Exhibit 3, to the enclosed area marked "Riv. Desplaines," which has already been testified as representing the Desplaines river, and to the two sets of lines by which that river is delineated and its course enclosed; one is the firm, continuous white line on one side and the other is a set of dotted lines adjacent to it, and which is outside of the firm line most  
202 of the way, however, in one or two instances, it seems to be reversed. What is this dotted line, or what are these dotted lines?

A. It represents the meandering line of the Desplaines river.

Explaining the condition between the index plat and the section plat, Orr Exhibits 1 and 2 are indexes of books, plat books 1 and 2 in the Canal Commissioner's office at Lockport. The index plat is on a small scale, showing the whole area of what is in the book. The book is made up of section plats showing, on a large scale, each section in the canal. The three books known as plat books 1, 2 and 3, which I have referred to, contain section plats of the canal for its entire length, from Bridgeport on the northeast, down past Joliet and Dresden and clear to Ottawa, or the west end of the canal. Each of these books has an index plat on the front, and then section maps for the detail work following it. These section maps throughout the course of the Desplaines river delineate these dotted lines upon each side of the river. Those plats were prepared by A. J. Mathewson, Assistant Engineer of the Canal Trustees. He was employed by the Canal Trustees in 1847 and 1848.

The blueprint now shown me, which is marked "Orr Exhibit 6," for identification, is a representation—it is a tracing of plat book No. 1, representing Sections 3, 4, and 5, Township 38, North Range 13, East of the 3rd P. M., showing a part of Mud Lake. This is a part of the plat that was surveyed, and to which I have heretofore referred, made at the time, and by the person to whom I have already referred. I

know from practical examination it is a true copy in every respect.

Counsel for complainant thereupon offered in evidence a certified copy of the plat of map of Beard, part of Handy's part of the Town of Kankakee, laid out between the mouth of the Kankakee and AuPlaine river, in Section 36, Township 34, North Range 8, East, certified by Fred S. Johnson. Said plat was thereupon marked as complainant's Exhibit A-1. (Atlas, p. 3929.)

Objected to as incompetent, irrelevant and immaterial and no proper foundation laid.

Counsel for complainant also offered in evidence a certified copy of a plat of Buffalo, a town laid out in the northwest quarter of Section 2 in Township 34, North of Range 9, East, in Will County, properly certified by the proper officer of the county. Said plat was thereupon marked as complainant's Exhibit A-2. (Atlas, p. 3930.)

Same objection.

Counsel for complainant also offered in evidence a certified copy of a plat or map of the School Section Addition to the Town of Joliet, Cook County, Illinois. Said plat was thereupon marked complainant's Exhibit A-3. (Atlas, p. 3931.)

Same objection.

Counsel for complainant also offered in evidence a certified copy of a plat of Juliet Subdivision of the southeast fractional quarter of Section 9, Township 35, North Range 10, East of the 3rd P. M., platted May 13th, 1834. Said plat was thereupon marked complainant's Exhibit A-4. (Atlas, p. 3932.)

Same objection.

Counsel for complainant also offered in evidence a certified copy of the plat of Subdivision known as West Joliet, a survey and Subdivision of the west  $\frac{1}{2}$  of the southeast  $\frac{1}{4}$  of Section 9, Township 35, North Range 10, East of the 3rd P. M. Said plat was thereupon marked complainant's Exhibit A-5. (Atlas, p. 3933.)

Same objection.

Counsel for complainant also offered in evidence a certified copy of a map or plat of the Town of Vienna. Said plat was thereupon marked complainant's Exhibit A-6. (Atlas, p. 3934.)

Same objection.

204 Counsel for complainant also offered in evidence a certified copy of the plat of Lockport. Said plat was thereupon marked complainant's Exhibit A-7. (Atlas, p. 3935.)

Same objection.

Counsel for complainant also offered in evidence a certified copy of plat of West Lockport, together with a certificate of vacation in 1855 attached. Said plat was thereupon marked complainant's Exhibit A-8. (Atlas, p. 3936.)

Same objection.

*Cross-Examination.*

I have a personal knowledge that Mr. Mathewson made the maps I refer to. Mr. Mathewson told me he made those maps and that he preserved a copy, and they are in his own handwriting; the printing is in his own handwriting; all this work was his tracing. On these copies presented here, his handwriting is represented; that is his printing; his handprinting. I know his handprinting. I have known Mr. Mathewson since 1900. He is not living now. These maps were made in 1847 and 1848. I was not there when they were made. I am now 52. I was not living at the time these maps were alleged to have been made. In addition to what I have said, I base my statement that these were made by Mr. Mathewson from certificates; that is to say, the certificates tell that they were made by a certain person. The certificates to which I refer are in the records of Will County. I could not say whether there are any certificates there signed by Mr. Mathewson which show that these maps were made by him. I  
205 speak of the public records, and he was the surveyor, county surveyor, there for some time. There are no certificates there that show that these particular maps were made by Mr. Mathewson. The maps as recorded bear a date. This date here that I produce is June 5th, 1847. I understand that to be the date at which the map was made. There is a date other than that on the maps as they are recorded. The original maps of Mr. Mathewson were not recorded at all. These  
206 are copies of the original maps; duplicate copies. The canal people kept the original copies and they are in the canal office now. I cannot say whether or not the maps which are in the Canal Commissioner's office are copies of the original. These maps that I produce are copies of that one in the canal office.

Q. You don't know whether that is the original or not?

Question objected to as immaterial; he stated that they were the canal records, and that is sufficient for the purpose. Whether Mr. Mathewson made two or three sets and kept one of them and returned another to the Canal Commissioners or Trustees by whom he was employed to make a survey of the plat, is immaterial.

A. That is the original plat, so far as the canal records go, that I can find.

So far as the records go, that is the original map, with the Trustees; that is all the original that I know of.

Q. Do you know that it is an original at all?

Question objected to as an attempt to assume a state of facts.

A. I do not know particularly that it is, but it is an original. I mean it is the first copy of the records of survey made by Mr. Mathewson from Ottawa to Chicago, on the canal. That is, it is a copy of what appears in the Canal Commissioner's office, as to that survey—is the first copy; that is, the original map made by Mr. Mathewson from that survey. It is in his drafting, his delineation; that which is there in the office, was made by his hand; that is his work; that is the way I identify the work. I could not swear that that which is in the office was made by his hand. I did not see Mr. Mathewson draw the lines on the cloth. I take it that it was under his direction, and that he altered and made these notes as he saw fit, and corrected them from time to time. The records and correcting, dating from 1837 to 1892, are his handwork. I knew Mr. Mathewson as a neighbor. He lived in Lockport, and I lived in Joliet. I had some business over there. I do not know of my own knowledge whether or not those meander lines correctly represent any meander lines shown by the survey of that property. I do not know when the meander lines were placed upon the map. They were made, though, at the time of the map. I know that from the work.

There are no characteristics in that dotted line that show me it was made by Mr. Mathewson. I have no knowledge of my own as to when that meander line was traced; whether it is the correct meander line of the stream or not, I have no personal knowledge. These Exhibits,—the same being plats, which I have identified and which are marked Exhibits Orr

from one to six, inclusive, are true and correct copies of 208 plats in the office of the Canal Commissioners, purporting to be made by Mathewson. There is just one set of those plats in the office of the Canal Commissioners, purporting to be made by Mathewson. These Exhibits are copied from the only plat of the survey, as made by Mathewson, which is on file in the office of the Canal Commissioners.

Q. I direct your attention to the following question and answer appearing in your cross-examination: "As a matter of fact, were the original maps of Mr. Mathewson recorded at all. A. No, sir." In that answer did you mean to state that that had not been recorded in the recorder's office as land titles are recorded?

A. Yes, sir.

Q. Did you have any other meaning than that?

210 A. No, sir. I have seen the book in which these plats appear in the office of the Illinois and Michigan Canal. There are three books, and I have exhibited the detailed pages 1 and 2 here, Exhibits 1 and 2, and they constitute all these sections, a delineation of all the sections cut and traversed by this canal and this survey by Mathewson. They do not purport to be a survey of the canal land; they do not purport to be a survey of the canal 90-foot strip. The title of that book reads, "that book numbers 1, 2 and 3 Canal Survey," that is the title. That is all there is; that is all that appears on the book aside from plats themselves and the index. I made these blueprints by the blueprint process. I took that from Mr. Mathewson's own work. This is a copy of Mr. Mathewson's own work. I did not get this from Mr. Mathewson myself. These are the Sanitary District maps purchased of Mr. Mathewson. Mr. Mathewson made them. These blueprints were made by Mr. Pierson this week. I got Mr. Mathewson's tracings; it was the original, these are duplicates.

Q. Mr. Mathewson, then, kept the original himself, did he not?

Question objected on to the ground of ambiguity as being directed to the blueprint and asking whether the thing from which the blueprint was printed was the original which, in the connection in which it was used, specified that it was the original as to the blueprint, and later giving it the significance in the following question of its being the original of the work done for the Canal Commissioners.

211 Q. Isn't it true that Mr. Mathewson kept his original tracing and that that is what the Sanitary District acquired?

Question objected to on grounds already indicated.

A. No, sir.

We left it in the Canal Commissioner's office. The original is in the Canal Commissioner's office.

212 Q. You are sure of that as anything you testified to? Objected to as improper.

A. The original plat is in the Canal Commissioners' office. The original plat made by Mr. Mathewson is in the Canal Commissioners' office. This I have here is a duplicate from that in their office.

This is Mr. Mathewson's work; his private excerpt from that record; I mean by that, private tracing. I do not mean that these particular documents that I have produced were themselves made by Mr. Mathewson. This print was made by Frank Pierson in the Tacoma Building, from a tracing that the Sanitary District purchased from Mr. Mathewson. Then I went down to Lockport and compared it with the original in the Canal Commissioners' office. This is a duplicate of the plat records that are in the Canal Commissioners' office. I don't say that the one that is on file down there and the one that was copied here in the Tacoma Building were made at the same time by the same person, but it is an exact copy. The reproduction here is an exact copy of our record.

I personally took with me the blue print and tracing from which the blue print was made to Lockport. And I compared that blue print and tracing and each of them, with the original in the Canal Commissioners' office at Lockport. These blue prints which have been introduced in evidence, and which were prepared in the way that I have described, are exact copies of the original records in the Canal Commissioners' office at Lockport. When I say "original records," I mean books 1, 2 and 3 which I have described down there and nothing else.

215 ARTHUR C. CLEMENT, a witness for complainant, testified as follows:

*Direct Examination.*

I am 56 years old, was born here in Will County. Have always lived here except an absence in boyhood prior to the time I was ten years old. I have lived right on the banks of the Desplaines and gone up and down the river in boats from an early period of my life, practically every year, say from 1864 to 1900. I have not boated on that river since the 216 drainage canal water was turned in. I had a boat-house at the lock at Jefferson street bridge, kept in it a clinker-built keel boat, 14 feet long, capable of carrying about a thousand pounds. I loaded it to the full capacity on the river lots of times. Before that I had a flat-bottomed boat 14 feet long but smaller than the clinker. After that I got a 16-foot boat, also a canoe, also a half interest in a semi flat-bottomed boat, also I had a sail boat there. The semi flat-bottomed boat drew a foot of water loaded. It would carry 217 seven to eight hundred pounds. The sail boat was 22 feet long and drew two feet of water and would carry probably three tons. I did not use that on the river. We went with that by way of the I. and M. Canal on the Chicago river and Lake Michigan up to Chicago and to Lake Superior. We did use it on one or two experimental trips in the upper basin through the upper locks and up to the tow-path bridge on the Desplaines once or twice. When I was using the river ordinarily from the middle of May until October I was down on the river nearly half the time.

218 I started in life as an attorney and followed it up by the loan and real estate business. Since 1895 I have kind of retired.

As to the depth of water in the river, there was plenty except that up the rapids this side of Brandon's bridge and a little below and the rapids at Treat's Island. There was no trouble in running a boat down there that would draw even three feet of water, if you knew the channel. Between Lockport and a point two miles above Joliet the river is not 219 navigable for small boats. From Malcolm's dam down to the mouth there was plenty of water until you got down about a half mile this side of Brandon's bridge. There was



a shallow place there amongst the bowlders. I had no trouble in running a row boat there, if I knew where to go, drawing fifteen inches of water. Then you had clear sailing if you knew the channel, right straight through to Treat's Island. There you took the left hand channel going down, that is the east channel. That was the deepest channel. About one-third of the way down the island there used to be an old dam, I think, or something. There was the shallowest place. I have grounded there a great many times; sometimes I had to get out and pull it over. Generally I could pole it over.

The length of that shallow place was not, I don't think, over 100 feet. After that the water was deep until about the mouth of the Du Page river. There you had to know the channel, or a boat drawing fifteen inches might strike bottom. Then you had clean sailing until just below the aqueduct there was an old dam used to be there and you passed through a rather narrow channel there. Below that it was all bowlders for half a mile to the mouth. If you dodged the bowlders you were all right. If you did not you would come to grief. These were loose bowlders. There would be about three or

four inches over the top of them, maybe two feet of water 220 between them. The bowlders were about three feet in diameter, a great many of them. There was plenty of water between the bowlders if you could dodge them. About 1885 I made a trip from here to a mile below the junction of the Kankakee and Desplaines rivers and returned on the canal the same day, making a trip of about 32 miles from eight o'clock in the morning until ten at night. That was probably either in June or September; there was no trouble on the water that trip. I made two carries, one from the canal into the river, one from the Illinois river into the canal.

We did not have to pole at all that trip. The boat loaded 221 as it was drew between twelve and fifteen inches. We put in opposite the oatmeal mill, about three-quarters of a mile below Jefferson street.

At that time a boat drawing two feet of water would find the river navigable in the condition it then was.

If the loose bowlders were removed and the hundred feet of shallows were excavated at Treat's Island, and the 222 bowlders at the mouth and at Brandon's bridge were removed, I could run a boat carrying three feet of water on that. I presume in the neighborhood of three-quarters of

a mile, taking all these three together, would have to be cleared out before you could get through drawing three feet of water.

The part of the river up near Lockport I could not run a rowboat on at all, and did not go there.

Lake Joliet before the deep cut was put through was quite deep, in some places more than sixteen feet. Lake Joliet is about five to five and a half miles long. Mount Joliet would be almost at the head of the lake, about a half mile down from the head. Mount Joliet has been pretty near all carted away by being used for gravelling and clay for tile drains. The mount is now pretty near level. They were carting it away in 1863. The place above Joliet where we could not get through was very rapid—a very rocky channel and there was not water enough there to float a boat over. That extended about two miles. The back water from dam number one went up to Wood's Island. I never went above that.

Witness is shown Cooley profile which is marked for identification Exhibit 1 of Complainant's Depositions. Witness was unable to make use of the profile.

*Cross-Examination.*

North of Joliet I have seen the river from the train as far up as Lockport.

For a mile and a half to two miles north of Wood's Island you could not run a small boat either way. My boat house was in the vicinity of the guard lock at Jefferson street.

The I. and M. canal and the Desplaines were coincident at that point. When I went down the river I generally went through the locks into the canal and pulled the boat over at the Malcolm dam or below there at the oatmeal mills. Then I ran down the rapids past Brandon's bridge and so on to the mouth of the river. There was a stone dam, the Jefferson street dam, across the river just at the boat-house. That dam formed what was known as the lower basin of the I. and M. canal. I went in the canal as far down as Malcolm dam.

That dam used to extend north of McDonough street. It is gone now. A man who was an experienced oarsman could descend the river from Malcolm dam to the head of

Lake Joliet with safety, but would have lots of trouble; the trouble would come from shallow water and bowlders. I would not say he would be in danger of being overturned; I never knew of anyone being tipped over there in ordinary water. It is not a fact that very few people went down the river. I can remember a good many.

From the head of Lake Joliet to Treat's Island there are rapids. Treat's Island is a little less than half a mile long

After passing the foot of Treat's Island down to what is  
228 now Smith's bridge it was dead water half the way, and then the current began, and passing under Smith's bridge there was plenty of good current. Passing the mouth of the DuPage there is a good, heavy, swift current. After that the current slowed down until I got about to the cut-off, and there it is practically dead water until you pass the aqueduct. From the aqueduct to its mouth it is good water until you get to where the old dam was and there there was a narrow channel through. I should say there was at least three feet of water there. Below that you entered into about a half mile of bowlders, about three feet of water in depth between the bowlders.

Q. At the mouth of the Desplaines isn't the current very rapid, boiling?

A. I should not say so; there is a good heavy current above the mouth.

Q. And the water is in waves from the rapid declivity?

229 A. Unless it was high water it was not, but since the drainage canal turned their water in, why, it is.

Q. Was it worse in low water?

A. If it was as you describe it, I would have smashed a boat there, and I have been through there a thousand times, I guess, and I never smashed a boat there yet.

If a man did not understand a boat I don't think he had any business there.

Q. The man who attempted it was considered somewhat of a dare-devil?

A. No, I don't think so. I never heard of people being capsized there. I never was. I ran right through there at the mouth of the Desplaines without any trouble, did not hit a rock on the passage. Went a clean shoot from here down there. I came up on the canal in '85 because it is easier to pull a boat in dead water sixteen miles than to pole it up

against the current. I could have brought it back by  
230 the river. I could have paddled it and poled it and  
rowed it.

Q. Do you think you would have had to get out and pull  
it?

A. Well, I have done that at Treat's Island. I have  
brought it back without getting out hundreds of times. I  
have paddled a boat up that stretch of the river from that  
aqueduct to the mouth of the Desplaines right up the current.  
The current was not too swift. I paddled about as well as  
an Indian. There is no trouble of going up that stretch of  
river. I have been down there with boat-loads of passengers  
who were green and could not help me any at all, hardly, and  
I got up the river from the junction to Joliet as far as Bran-  
don's bridge. I have done it time and time again. Some-  
times I did get out of the boat. It was easier to get out and  
pull a little than it was to work in the rapids. It is not a  
fact that just below the junction of the rivers there was not  
sufficient water to float a boat or that it was necessary to one  
going up or down that stretch to get out and pull the boat  
along. I never had any trouble of that kind.

There is a place down below the junction about a mile  
231 and a half where there are some sand bars. That is in  
the Illinois river. I have got into difficulties there. It is  
not a fact that at Treat's Island at most seasons of the year  
you have to get out and pull the boat by hand. I will pull a  
boat up there with oats or a paddle any time. My boat drew  
about fifteen inches when it was heavily loaded. My boats  
were good grades of row-boats, \$50 row-boats. I remember  
the depths of water as far back as 1865. There was more  
water after the deep cut went in in 1872, I think. I have pad-  
dled a row-boat from the mouth of the Desplaines river up  
the river to Malcolm's dam between the years 1865 and 1871. I  
would not say that I did it without ever getting out of the  
boat. It was done for pleasure.

232 Q. Have you stated to any one within the last thirty  
days that it was perfectly absurd to contend that the Des-  
plaines river was a navigable river?

A. I don't think I said that. I made the remark that I  
understood that the Desplaines river was not a navigable  
river, and that the Supreme Court of this state had deter-  
mined it was not navigable.

Q. And did you not in that connection state that you knew

of your own knowledge it was not navigable, because you had been obliged to get out and pull a row boat, even in places in the Desplaines river?

A. I don't remember saying that. I would say it now, because I have got out.

Q. As a lawyer and a man who is familiar with the Desplaines river, and knowing that the river is not a navigable river that is capable of carrying commerce in the ordinary way in which commerce is carried on; I ask you whether or not in your opinion the Desplaines river is a navigable river?

COUNSEL FOR COMPLAINANT. The question is objected to, as not cross-examination, and as embracing elements of supposed legal determination by the Supreme Court, which 233 should be separated from the question; so that the element can be judged of separately. The witness probably refers to the case which has been cited by counsel for defendant in the argument for an injunction in this case, in which it is stated in the opinion of the court that it was stipulated by the parties that the river was not navigable, and which is the only reference to that subject which occurs in the decisions of the Supreme Court; where the owner of the dam on one side, and the Commissioners of the canal on the other, which desired to obtain and make use of the water of the river; one for the purposes of his mill, and the other for the purposes of their canal; and where the parties having mutual interest that the river should be considered as non-navigable, which is the only decisions by our court upon the navigability of the Desplaines river.

Mr. MUNROE. I object to the argument and dissertation of Mr. Starr, and move that it be stricken out as entirely improper.

The WITNESS. I have always understood that the Desplaines river was non-navigable.

Q. From your knowledge of the Desplaines river, I ask you, in your opinion, whether or not the Desplaines river ever was or now is capable, without improvement, of carrying commerce in the ordinary way in which commerce is carried on in this country?

COUNSEL FOR COMPLAINANT. The same objection made to all the questions before may be considered to each and all of them repeated here.

A. Why, in its present condition you couldn't carry on commerce. Of course, I understand you can put a flat bot-

tomed boat on a river and put a wheel on the back end and navigate it in three feet of water.

Q. That the currents in this river are such that you simply could not go up it or go down?

A. I don't think the currents are that way. Certain points in the river are too shallow for it, even now.

I have never seen any fences across the Desplaines river at any point, and I have been down the Desplaines river 234 every year from 1865 to 1899. I heard the first time I went down in 1865 that there were fences across the river down near the mouth of the DuPage and that it was dangerous to run there and strike those fences, but I went down and I didn't find them and I never did. I don't know that there were any fences maintained during that period by Mr. Adler at Smith street, nor between South street and Brandon's road. I have gone down the Desplaines river in times of high water. There was no difficulty then. It was easy then. I did not come up. There was too much current. I could row my boat up. I would be willing to bet I could. I did not want to.

*Re-direct Examination.*

Q. Your statement on cross-examination of your opinion as to the non-navigability of the river is meant to apply to the river without improvements in the respect you mention in your direct examination by the removal of boulders and excavations?

A. No, sir; I always understood that the river was non-navigable. I don't know exactly what navigability means, to tell the truth. I have always understood from other attorneys, that the decisions of the Supreme Court were always 235 ways that it was non-navigable, and I always regarded it as that. But not having any clear idea in my own mind what navigability means, I haven't got any.

Q. And having given your impression from the statements from other attorneys, you were repeating opinions so obtained, in answer to Mr. Munroe's question?

A. Yes, sir; I never have looked it up.

Q. You don't mean to be now understood as expressing an opinion of your own on that subject?

A. I have no opinion.

Jefferson street dam is gone out, the drainage people took

it out about 1898. The old dam near Treat Island was across one branch. There is none showing there at all except that the water was shallow at that point. The other shallow point was incident to an old dam about three-236 quarters of a mile below the aqueduct. There is nothing there to show what kind of a dam it was, nothing more than there were rocks there, did not show above the water.

*Re-Cross Examination.*

There is a very heavy current at McDonough street since the dam was taken out.

Q. Assuming that dam number one was not in the river—

A. That is the dam up above here?

Q. Yes, sir, that is the dam that the Economy Light & Power Company now has; and solely upon your knowledge as to the conditions in the river, I will ask you to state whether or not in your opinion the Desplaines river is capable, in its present state, of carrying the commerce of this country up and down the river?

Objected to as not re-cross and because the witness has declared he has no opinion and because of indefiniteness and as irrelevant, incompetent and immaterial.

A. The rapids at the Sault Ste. Marie are 16 feet fall there in a mile; and the rapids are so stiff there that nothing can go up except in places by professional Indians with poles. It is a rapid, the worst in the country. And the fall through here to the head of Lake Joliet is nearly double that amount.

237 Q. I understand, you then answer my question by saying no?

A. If that dam was taken out, it would be a raging rapid, with double the fall of the Soo rapids.

Q. And could not be used for commercial purposes?

COUNSEL FOR COMPLAINANT. I object.

A. If there was water enough, you could go down a-kiting, but you couldn't get up.

COUNSEL FOR COMPLAINANT. We will enter a motion to strike out the re-cross examination.



238 WILLIAM W. STEVENS, a witness for complainant,  
testified as follows:

*Direct Examination.*

My name is William Wallace Stevens; my age 78. I have lived in Will County since November, 1855, was born in Rumford, Maine, came to Illinois in November, 1855. My first place in Illinois was at the Old National Hotel. My first work was teaching school in Dresden, Grundy County. I  
239 went down there the same month I came. I finished that school in March, '56, and came back here until September. I read law with Parks & Elwood here in Joliet and became a lawyer. I have been an editor of the Joliet Record from 1880 to 1900. I have made a study of the history of Will County and published a book on the history of Will County. There was a history of Will County published prior to mine. It was prepared by George H. Woodruff. He was one of the old residents of the city here. He came, I think, in the spring of 1834. I knew him well from the time I first came here until his death in 1890. As matter of current reputation and history of Joliet and Will County I was acquainted with the standing and acceptance of the history that he published. It was of good standing. He has a name as a  
240 historian since publishing that book. This book, marked for identification Complainant's Exhibit 2, is Woodruff's History of Will County that I have referred to, and was published by William LeBaron, Junior, & Company, 186 Dearborn street, Chicago, 1878. I did not know Perrin or Hill. Mr. Woodruff was the first recorder of Will County.

Passage from page 607 introduced in evidence as Complainant's Exhibit 2 as follows:

241 "The Kankakee being navigable for small steamers to the eastern point, an outlet is thus furnished for the upper portion. Though navigation has been improved by the building of dams at Wilmington, it has in reality been used for that purpose during wet seasons since the earliest settlements of the adjacent country. As early as 1834 the products of the farm were boated down the Kankakee to the Desplaines and up the latter river to Chicago. It is related that during the year named some parties loaded a boat on Sugar Creek, a tributary to the Iroquois with

300 bushels of oats, 300 bushels of wheat, and some hams, with the design of taking them to Chicago to supply the garrison stations there. The trip down the Kankakee was accomplished without accident or unusual trouble, but after entering the Desplaines, when near Treat's Island the boat dipped water and so dampened the grain that they were obliged to unload and try to dispose of their produce at that point. At the time settlers were arriving in that neighborhood quite rapidly and they had no trouble in disposing of their whole cargo, the oats at 50 and the wheat at 75 cents per bushel. At present small steamers owned by Messrs. Small of Wilmington and Stephen F. Hanford, of Warner's Landing ply regularly between these points and Chicago, carrying to that city corn, oats, rye and other products, and bringing back lumber, salt and other heavy articles. The 'landing' which is located near the eastern point of the township is considered the head of navigation during the dry season, but when the river is ordinarily full boats can run much higher."

241a

The title page and preface of the book are as follows:

"The  
History  
of  
Will County,  
Illinois,  
containing  
A History of the County—Its Cities, Towns, &c., a Directory of Its Real Estate Owners; Portraits of Early Settlers and Prominent Men; General and Local Statistics; Map of Will County; History of Illinois, Illustrated; History of the Northwest, Illustrated; Constitution of the United States, Miscellaneous Matters,  
&c., &c., &c.

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ILLUSTRATED.

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Chicago:

Wm. Le Baron, Jr., & Co., 186 Dearborn Street,  
1878.

241b

Preface.

In presenting our History of Will County, we deem a few prefatory words necessary. We have spared neither pains nor expense to fulfill our engagement with our patrons and make the work as complete as possible. We have acted upon the principle that justice to those who have subscribed, be they few or many, requires that the work should be as well done as if it was patronized by every citizen in the country. We do not claim that our work is entirely free from errors; such a result could not be attained by the utmost care and foresight of ordinary mortals. The General History of the County was compiled by Hon. Geo. H. Woodruff, of Joliet, and the Township histories by our historians, W. H. Perrin and H. H. Hill. Some of the Township Histories are indeed longer than others, and have been the scenes of more important and interesting events. While fully recognizing this important difference, our historians have sought to write up each township with equal fidelity to the facts and information within their reach. We take this occasion to present our thanks to all our numerous subscribers for their patronage and encouragement in the publication of the work. In this confident belief, we submit it to be the enlightened judgment of those for whose benefit it has been prepared, believing that it will be received as a most valuable and complete work.

THE PUBLISHERS."

241c This book you now show me is a bound volume of the Joliet Signal for the years 1846, 1847 and 1848. It is kept in the public library and is a part of the public library of Joliet. The library label of the book is, "Joliet Public Library. Reference Book. Not to be taken from the library. Class No. R071JS. Accession No. 1057."

I was acquainted with the Joliet Signal as a newspaper from the time I resided in Will County. It ceased to be published in 1900. It was published regularly as a weekly newspaper at the time I came to Will County and continued to be all the time up to 1900. It was a newspaper in general circulation in Joliet and Will County at that time. My information from

the current reputation and history of Joliet and Will  
241d County is that that paper was in general circulation in Joliet and Will County in the years 1846, 1847 and 1848. Complainant's Exhibit 3 offered in evidence appearing in

the paper under the heading "Joliet Signal, Joliet, Illinois, Tuesday, June 8th, 1848" (reading):

"Appalling Accident. Ten Men Drowned. It becomes our duty to record a most painful accident which happened yesterday morning, about fourteen miles south of this place on the Desplaines. A boat containing sixteen men was sunk, and only six of the number were saved.

It appears that they were at work on the canal, and boarded on the opposite side of the river, and when returning from their breakfast, the boat was sunk by a yoke of oxen which was on board becoming ungovernable and moving so near one end as to cause it to fill with water. It was just above Beard's mill, and in about twenty feet of water. We learn that the bodies have been recovered.

It is reported that C. Delmore, John Dougherty, P. O'Neill, ..... Turner, Jas. Dunn and Chas. Kelly of this place are among the drowned. The names of the others we have not learned. Five of those who made their escape were from this place, viz.: David Major, J. Kelly, J. Mulholland, C. Stevens and James Davilin."

242 I have made a study of the early history of northern Illinois and Will County. I wrote the book which was published by S. J. Clark & Company, Chicago, in 1907, entitled "Past and Present of Will County, Illinois." I knew the late George H. Woodruff well; I heard him lecture on that subject.

I have been connected with the Will County Old Settlers' Society, the Will County Pioneers' Association a good many years, and I have been president. It was organized in 1880 and has continued in existence to the present time. I united with it about fifteen years ago and have been an officer  
243 all of the time since. It had about 150 members when

I joined. I was personally acquainted with the greater portion of them at that time.

Mr. Woodruff, whose lectures I have heard, was a member of the organization. The lectures were printed in his lifetime in the Joliet Republican here when James Goodspeed was the editor, and were afterwards published in book form and bound in with another book.

I have a copy of the book here.

- The book Stevens Exhibit 4 was printed in 1875. I have had the book all the time since then. It is entitled "Directory of the City of Joliet for 1875, etc."

At the end of the book is a supplemental title page reading as follows:

244 "Forty years ago. A contribution to the early history of Joliet and Will County. Two lectures delivered before the Historical Society of Joliet, by George H. Woodruff, December 17, 1873, and March 24, 1874. Published by James Goodspeed, Joliet. Joliet Republican Steam Printing House, 1874."

On the reverse side of the title page is a copyright memorandum as follows:

"Entered according to the Act of Congress in the year 1874 by James Goodspeed, in the office of Librarian of Congress, Washington."

On page 5 is the title:

"Lecture 1. Delivered at the Central Presbyterian Church in Joliet, December 17th, 1873."

I was present. I heard one of the lectures. I am quite certain it was the first. I don't know but I heard both of them. I presume I was present at both. The house was pretty nearly filled. There must have been five hundred probably present, embracing the Old Settlers and others. Mr. Woodruff's statements were always accepted as true and authoritative on all matters of history in regard to the settlement of Will County, and from that time forward he was known as the historian of Will County. The society to which I have referred was called also the Will  
245 County Historical Society. It is the society referred to on the title page and in the preface. The preface is by the late Judge John M. Wilson, of Chicago, who was formerly a resident of Joliet. I knew him as a resident here.

COUNSEL FOR COMPLAINANT. I will offer in evidence the passage on pages 34 and 35 of this supplementary book by Mr. Woodruff as follows:

"But there was also another famous city, just over the line in another county, of which a little Dutchman, Johnny Beard, was the proprietor. Johnny thought this was to be 'one very great city.' He made a splendid looking one on paper, with the great Kankakee coming down from the east and the Desplaines and Du Page united from the north, the 'City of Kankakee' reposing in native beauty at the junction. Johnny used often to come up with his wife in a little old 'coachee' and was always full of his 'city.' He used to squeeze in a little whiskey,

too; but the old horses and coachee used to take him safe home, whether he could drive or not. He dug a dam across the Desplaines, a little above its junction with the Kankakee (which forms the Illinois), and commenced building a mill. But the next spring the Kankakee, which drains a great extent of country far to the east in Indiana, got on a rampage long before the Desplaines, which rises much farther in the north, and coming down with its great volume of water and ice, dammed up the Desplaines—turned its current northward, and sent Johnny Beard's dam, city, mill and all, a kiting up to Treat's Island, where it deposited the fragments. This was the last we heard of 'Kankakee City,' until some of our citizens 'struck ile' there a few years since, and sunk a well,—and sunk a little pile of money too."

COUNSEL FOR COMPLAINANT. I will also offer in evidence the passage on page 14, reading as follows:

246 "John Norman built a mill on this river"—the reference is to the Desplaines river—"at the head of an island which took his name, just above the penitentiary. He built a dam across one branch, which threw the current into the other, in which he placed his wheel, while the shaft at the other end connected with the mill gearing in a log mill." I omit various passages. "I remember visiting this mill in 1834. The island was then quite a romantic spot, being covered with a heavy growth of timber. The digging of the canal has almost obliterated the locality.

COUNSEL FOR COMPLAINANT. And on page 15 I offer a statement introducing a list of names as follows:

"The following are the names of other settlers in those localities now included in the Town of Homer, and that part of Lockport east of the river, and which were known in early days as 'Yankee settlement,' 'Gooding's Grove,' and 'Hadley.'"

(On page 378, *infra*, to avoid encumbering the record by attaching the Joliet Directory to the deposition, complainant's counsel gives notice that he expects to read further from that book on the hearing and will keep it accessible to counsel, and withdraws the attaching of the book as a whole to the deposition.)

247 Q. Where did you live when you first came to Will County, Mr. Stevens?

Temporarily I taught school at Dresden, Grundy County, in the winter of 1855, near the junction of the Kankakee and

Desplaines. I returned here early in March, 1906. I taught school in Channahon in the fall of 1856 and finished out a 248 school in the Aux Sable in Grundy County. I was admitted to the bar of Illinois in March, 1859. I am acquainted with the current reputation and common report as to the early history of the use of the Desplaines by early settlers and explorers, that is, the current reputation and common report in existence when I came here. I inquired a great deal. I was on the river a great deal and talked with a great many of the early settlers in regard to the use that was made of the river before the opening of the canal.

Q. What was the current reputation as to the early use of the river as you so obtained it?

Objected to on the ground that witness has no knowledge of his own of the early use of the river.

A. When I first came here most of the people, the early 249 settlers, were then living, and I became well acquainted with them. I talked with them a great deal about the early settlement of the city and county, not only with Mr. Woodruff, but with a great many others, among them Mr. Daggett and Mr. Fish and the Shermerhorn family at Channahon. They came in 1833 or '4. I boarded with them in Channahon.

Q. State in a general way what the current general reputation was on that subject as you received it from them?

Objected to as hearsay.

A. The current reputation was, up to the time of the opening of the Illinois and Michigan Canal, that the river was used more or less for transportation, certain portions of it.

I heard of the lower part of the river being used for carrying lumber. Parties themselves told me they brought lumber up and brought it down to Kankakee and up the Desplaines to the mouth of the Du Page and then up the Du Page to near their place there at Channahon. I was told that by John S. and Edward H. Jesup. I know them well; was often at their house and talked with them. They lived right on the bank of the Du Page, about one hundred rods from its mouth, or practically at its mouth. It was dead water from 250 the mouth up to that point. They came in 1834 as young men with their fathers.

Q. What was the incident that you referred to? What did they tell you about getting lumber, where they got it, how they got it, where they took it to?



Objected to as not being the witness' own knowledge; the objection to stand to all this line of examination.

A. When I was teaching school there it was the fall of the year. I used to go hunting considerable and Edward used to go with me. He took me over to what was called the cut-off and then I first heard of their bringing lumber from Kankakee or Wilmington down the Kankakee and up the Desplaines, and he showed me where they used to cross over in high water from the Kankakee over in the Desplaines through the cut-off. That was before the canal or feeder was built. He told me how they got it. There was no mill at that time. Treat's Island mill was not built until several years afterwards, and Wilmington was the only place they could get lumber for use there in Channahon.

He said after they came there with their father, Isaac Jesup, that they built a flat boat and would go up to Wilmington. When the wind was right they could sail right up the Kankakee to Wilmington with no obstructions at all. 251 They would load their boat and come back and if the water was high they would come through the cut-off into the Desplaines and up the Desplaines to the mouth of the DuPage and up to their little lumber yard they had near their house in Channahon. If the water was low they would go down around and come up the mouth. He spoke of having made the trip repeatedly by both routes; that they did that two or three years from the time they came there in the spring of 1834 to about 1836 or '7. 1837 is the time the mill was built at Treat's Island. There was a grist mill at Wilmington at that time and the only mill anywhere around there.

They would carry grain up to the mill on a boat. They carried it not only for themselves but for others from farms in that vicinity.

The lumber was mostly hauled for others, as I understood it. They got lumber as it was needed. They were building there a good deal at that time.

It was a flat bottom boat as they told me. My recollection is that it was 25 to 30 feet long and 8 or 10 feet wide. 252 They would bring down with them from four to five thousand feet of lumber at a time. My recollection is that it drew from 18 inches to two feet loaded; when it was light it wouldn't draw over 8 or 10 inches. I never heard them say that they had much of any difficulty in navigating the river

as it was then. Edward and John Jesup both died a good many years ago. Their father died fifty or sixty years ago.

I knew the late Mr. Henry Fish in his life time. He told me that he had a saloon at the Aux Sable locks, at the mouth of the Aux Sable river where it crossed the canal. We used to joke with him about his tapping his barrel at each end.

He told how he got his whiskey down there, and as I 253 understood it from him nearly all the time he was there

it came down in boats from Chicago. That was the first time I ever heard about the cut-off down there at Chicago from the Chicago river to the Desplaines. There was a cut-off there where they went through in high water. There was a portage when there was not high water and a water communication when there was high water.

Q. Who told you that?

A. He told me that.

Q. Who?

A. Mr. Fish.

Objected to.

That is what Mr. Fish told me. He said they could bring from four to eight barrels of whiskey at a time in high water by boats from the Chicago river down through the cut-off into the Desplaines river and from the Desplaines down to the mouth of the Aux Sable and up the Aux Sable a hundred rods or so to where his place was.

He told me they were Mackinaw boats. My recollection is he said he was there several years. Whether he got his whiskey that way all the time or only in high water I couldn't say. After pay day he said he sometimes sold a barrel a day to the men on the canal.

254 As I understand it it was a matter of accommodation at times that they would bring down other merchandise or whatever they wanted, tools, iron bolts and such like.

I know Swalms or Davidson's quarry in Joliet. I knew Mr. Swalm very well. It is located about a mile and a half or two miles southwest of Joliet near the head of the lake, a little above and opposite, on the other side of the canal. It was probably 150 rods nearly from the river. I have seen the road leading from where the canal is now down to the river below Brandon's bridge many times. I think I first saw it in 1856. It was a good road across the flat there and looked as though it had been filled in with strippings from the quarry. There was then stone and other material in the road

and it was deeply rutted as though heavy teams had gone down there with heavy loads. At its terminus at the river bank it came to a deep hole that was in the river at the head of the lake. There is a sort of a bend in the north end of the lake and the deep hole, and from there on down it was still water. It looked as though it had been a landing place, I don't recollect of any dock.

They told me at the time, and it was the current reputation that it had been used to haul stone from Swalm's quarry down to the river there and load it onto boats. I don't know what for.

I have used the river myself a good deal. I have been up and down the river a good many times up to twenty years ago, that is, about 1885, from the time I first came here. I have been up and down with boats. I have been down with teams and crossed it at various places and fished it and hunted it a great deal.

In July, August and September the water was generally low, especially when you got below Treat's Island, but in the spring and fall there was a good stage of water always. We used a two-oared and a four-oared boat. We had from three to six of us in the boat. There were six of us at once that went down and camped below Rock Run. We all went down in a boat together; that was in the fall of the year, about half way up the lake from Treat's Island, two and a half to three miles up the river. We had our tent and camp equipment and provisions. It was a four-oared boat, 18 to 20 feet long. The outfit would be 250 to 300 pounds. The boat must have drawn from 18 inches to two feet of water.

257 I identified this history of Will County by George H. Woodruff in my former testimony.

COUNSEL FOR COMPLAINANT. I will read in evidence here page 251 of that book.

Objection as incompetent, irrelevant and immaterial.  
(Reading):

"John Norman erected the first flouring mill in Joliet.  
\* \* \* About opposite the penitentiary there was an island in the Desplaines heavily wooded, a romantic spot where the writer often went in search of plants and flowers. At the head of this island across one channel, Norman built a brush and gravel dam, which threw the current strong upon the other side. Near this he built a

log mill. His wheel was placed in the current and the shaft running into the mill turned the machinery which ground the grain."

COUNSEL FOR COMPLAINANT. I also give notice to counsel on the other side that we expect to read from this book more at large at the hearing.

The Joliet Directory of 1875 (in which the Woodruff lectures are published) was in general use and circulation in Joliet in the year 1875 and the years following. It was the only one published at that time. I don't think there was any one published after that until 1881, '2 or '3, somewhere along there. I have always taken and preserved the directories. I have a large number on hand now. This directory was in general use and circulation from 1875 to 1180. There was no other in use.

I know Alexander's quarry. I have been there twice since the first testimony was taken in the case in January. Mr. Johnson and Mr. Anderson went with me the last time. We went to examine the quarry. We went all through it, from one end to the other, examined it thoroughly, and saw the floor of the quarry. There were leaves on it, but no indication that it had ever been excavated lower.

They measured the stones. My recollection is that twenty inches, I don't know, twenty inches, or perhaps two feet, was the thickest. I didn't pay attention to that. They attended to the measurements and I looked after some other things.

We also counted the piers of the Kankakee aqueduct. I had a man take a boat and we went out all around the piers and across the river. The thickest stones in the piers were 26 inches thick. There was no stone as thick as that in the quarry. There was no indication of any ledges thicker than 20 inches, I think it was.

I have known the witness Comstock well for forty or fifty years. I had a conversation with him on the subject of boats coming up the Desplaines river.

Q. You may state whether or not he made any statement to you as to boats coming up the Desplaines river and the method by which they came up?

Objected to as immaterial and improper.

He came to my office one day and I asked him if he knew anything about boating on the river. He said he didn't know anything about the river anyway, that he was hardly ever

on the river, but had surveyed up and down the banks and knew something of it. We talked for perhaps half an hour. He was very deaf. I had to halloo in his ear. I asked him if he didn't know anything about boats carrying stone down the river, and he said he didn't. I asked him how they got those large boats up over the rapids at Treat's Island. "Why," says he, "they warped them up; they put a tackle, fastened at the end of the bow of the boat, and they would take that tackle away up the river and tie it to a tree and draw the boat to that and take the tackle up to another tree and work on over the rapids." "Well," says I, "how long would it take them to get up over the rapids there?" "Well," says he, "it would not take them over half an hour."

That conversation was probably four or five weeks ago.  
260 (Right of further examination in direct of witness

Stevens is reserved, but he is submitted for cross-examination because counsel have expressed a desire to cross-examine him this afternoon.)

#### *Cross-Examination.*

I think Mr. Comstock came to Will County with his father somewheres about 1834 or '36; I don't know exactly. He has been here some twenty-one years longer than I.

I never noticed anything wrong about his faculties except his hearing. I was asking him if he knew of boats carrying stone down the river to the aqueduct and he said he didn't. Says I, "Did you ever know of any boats going up and down the river?" And he said, "No, not particularly," or something of that kind, and I don't know whether I said it to catch him or how it was, but I wanted to know if he did understand anything of it, and I asked him that question, that I didn't understand how they ever got those big boats back over the rapids there.

Q. When he was describing the warping of boats wasn't he describing how it was done on other rivers?

A. Well, he might have so understood it, but I particularly mentioned getting the boats back over the rapids at Treat's Island.

Q. He might not have heard you say Treat's Island?

A. Well, he might not; but I said it nevertheless. He might have understood it in that way, but I certainly asked him, that I didn't understand how they got those big boats

back them over the rapids at Treat's Island, and he said they warped them up.

He was not talking about any other part of the United States. We had not talked of any other river than this one. I had not asked him about any other river and he didn't talk about any other river that I recollect of. I might have asked him about the Kankakee, but it was about this river here, how far up and down the river he had been and all. He didn't remember of any boat going up and down and he said he hadn't heard of boats carrying stone down the 262 river. He answered me readily and I understood it to mean that he understood what I asked him, because he was a man of intelligence.

Yes, Mr. C. A. Munroe and Mr. Charles E. Kercheval came to my office last month and talked about my affidavit and knowledge of the river. My statements to them were correct. I had no desire to attempt to conceal anything or fool anybody. I was describing the thing as I believed it and understood it at that time. I discussed the fact that one of the Jesup boys had brought some lumber down the Kankakee river to Channahon. My recollection is that he was eighteen to twenty years old when he came there and his brother was older, about twenty-four. That was in 1834. That 263 conversation with me was when I was teaching school there at Channahon in the fall of 1856 and '7. I commenced there the first week in September and taught until along in January. I went hunting with Edward several times. It was when we went over the cut-off to hunt he used to tell me what a splendid place that was.

I don't recollect going to the cut-off with Mr. Jesup but once or twice. I went with several parties there. It was very convenient to go with him as he lived right near there and had a boat. We would go down the DuPage into the Desplaines then the Desplaines to the cut-off, and up that.

The testimony I gave was, as I recall it, the substance of what the two Jesups told me in the fall or winter of 1856-7. I recall of one or two other parties there going with them and carrying grain to get ground, and they would help navigate the boat to pay for their passage. I told Kercheval and Munroe that Mr. Jesup told me of carrying grain to Wil-  
mington, but not on a wagon.

264 I am positive that I never mentioned a raft to them directly or indirectly. I think it would be almost impos-

sible to float a raft up the Desplaines against the current. I didn't say to you that that was the only time that Jesup used the Kankakee or Desplaines. There were two Jesups. I recall staying at Mr. John Jesup's house several years afterwards and in the evening he told the story of his early life there in Channahon and how he spent his time and about his bringing lumber from Wilmington down the Kankakee. That is John Jesup. Edward was a younger brother.

His father's name was Isaac Jesup, and after he came there with his father they built a small flat boat and used it for that purpose.

Nobody told me about the dam at the mouth of the Desplaines river. There was not a dam there. That was in 1834 and 1835.

They didn't get any corn ground, as I understood it, except when they carried it for other parties. I don't know; they might have carried some for themselves, but other parties would go with them and they would help navigate the boat and they would bring their grain.

Q. Who went with them?

A. I recollect Mr. Isaac Schermerhorn; I boarded with him. He told me about going to Wilmington through the cut-off.

It enters the Desplaines on the east branch within a mile north of the aqueduct. They told me they brought their boat down the Kankakee river and up the Desplaines when the water was too low in the cut-off. The saw mill at Treat's Island was commenced in 1836 and finished in 1837. The grist mill was built shortly afterwards. I got that information from parties who knew. The Jesups told me that after the saw mill was built at Treat's Island they didn't have to go so far for their lumber.

My recollection of it is that the saw mill was commenced in 1836 and finished in 1837.

When I first came here in 1855 I saw the end of an old dam on the Desplaines river there at the mouth; I never heard of a dam there except one that was built in the fall and went out the next spring. That is a historical fact. I never could find out that there was any dam there that amounted to anything and lasted long. There are some of the boulders of the foundation there still. I have seen it many times. I don't recollect much about it. I recollect some logs sticking into the bank on the north side of the



river and some boulders lying on the logs. That was probably fifty years ago. It was a little ways up, might have been a hundred rods or a half mile from the mouth; it was between the aqueduct and the mouth.

267 Mr. Fish told me he brought his whiskey down the Desplaines river; it was in the spring of the year and it was practically impossible to get to Chicago and back with a team. Teams did do it in the summer time when the water was not high. There were no bridges across the sloughs and flat places, and they couldn't get to Chicago with a team except when the water was low and when the ground was dry. I have got that information from many a person. I couldn't give the names of any persons. It was general conversation that there were several months in each year it was impossible to get from here to Chicago with a team. I asked Mr.

Fish how he got his whiskey down there when the roads  
268 were bad, and he said they brought it down in boats.

Whether it was more than one time or forty times I couldn't tell. I couldn't give the year. I think he went there about 1837 or '8, and he was there three or four years. I talked with him several times about it. He didn't talk about how they got the boats back; they might have sailed it back or warped it back, as Mr. Comstock described.

I didn't see Woodruff's manuscript before it was printed. My knowledge as to Mr. Woodruff writing these books is what he told me. He told me he had written that, that is, the history and the lectures. He came to Will County in  
1864.

269 The passage in it that said 1878 "boats are now plying between Wilmington and Kankakee City and Chicago, carrying grain," went this way. They went down the Kankakee river through the Kankakee lock, what is called the  
270 upper lock there above the feeder, into the feeder, down the feeder into the canal and right up to Chicago. They didn't go into the Desplaines river except in the basin, but in 1834—as to the stone from the quarry I said I was told they were loaded onto boats and taken down the river. I said I understood that they were used in building the aqueduct piers.

I don't recollect the names of the persons that told me.

271 I used to live down there. I didn't see the stones shipped up. I made an affidavit in this case about the

20th of December, 1907. There was one mistake in date in it which, when you called by attention to it I had corrected. It said 1855 when it should have been 1835.

Q. That was the only mistake?

A. I stated it as a fact and I should have stated it as information and belief.

Q. You stated under oath at that time that "affiant further says that he knows of his personal knowledge that the Desplaines river was navigable and was navigated for a period of from 15 to 20 years after November, 1855, and that said river was navigated for commercial purposes during at least six months of each year, except as the same was interrupted during a part of that time by dams at the City of Joliet in Will County. Affiant further says that boats plied on said river of approximately the size of 30 feet in length and about 7 feet deep, and that said boats would carry from four to five tons of merchandise or freight, and would draw from a foot to 18 inches of water when so loaded. That said boats were propelled by sails, poles and oars."

I ask you if you did swear to the above stated as read to you?

A. It should have been 1835 and on information and belief. I heard these boats were loaded with whiskey and loads of corn. They were Mackinaw boats. I have seen a 272 great many of them. Mr. Fish told me they brought down three or four barrels of whiskey. He may have told me the size of the boats. He said it was brought down for him. I never heard of teams going back and forth to Chicago every day from the Aux Sable. I never knew of a stage being built so as to carry a barrel of whiskey. It was about twenty years before my day, some of it. When I hear good men tell me things that are true I take it for granted it is a fact, especially such a man as Mr. Woodruff or the 273 Jesups. I knew them well. I cannot at this late date describe every instance that I have heard of the river having been used for commercial purposes, not at this late date. It is too long ago. Personally I don't know of the commercial uses of the river. I did not say that the boat coming up to Treat's Island and Fish carrying his whiskey down and Jesup bringing his lumber were the only instances I knew. I said I knew those as instances.

I have heard of the rafts coming down; I have heard of boats coming down. I can't remember for fifty years any

better than you can. Mr. Woodruff's lecture was not over thirty-five years ago. It is only what they told me, what the two Jesups and Mr. Schermerhorn and Mr. Fish told me and what I got from Mr. Woodruff's lectures and his book.

273 There is no impression about it. I take that to be a fact.

Yes, I made the statement now that the river was commercially navigated for at least six months each year.

I am employed by the State of Illinois in this case. I was first retained sometime in November. I have been interviewing witnesses and procuring witnesses. I have got a few. I went down to see Mr. Reed at Stark County; I went to Aurora and some other places. I suppose I am in their pay. They haven't said anything about it and I haven't asked them. Mr. Riley asked me to attend to this. He is the representative and he said he wanted I should take charge of it and would see that I got my pay, but I haven't got anything yet.

275 Directory withdrawn from attachment to the deposition and notice that complainant would read further from it at the hearing and keep it accessible.

276 HARLOW H. SPOOR, a witness for complainant, testified as follows:

*Direct Examination.*

My birthday was July 3, 1820. I was born in Lyons Township, Ontario County, New York.

I landed in Chicago and came to Kendal County September 20, 1844. I took up my residence in Will County, Jackson Township, as a school teacher November 2, 1844. I made a settlement there in the spring of '44, bought real estate there, made my residence there until '54, when I came to Joliet.

The attention of the witness is directed to the item 277 from the Joliet Signal, June 8, 1847. Asked whether he knew of that event. "I recollect of hearing of it at the time."

The attention of the witness is directed to the passage 278 read from Woodruff's History in the deposition of Mr. Stevens, about the boat coming up the river with grain and dipping water at Treat's Island.

I remember of hearing of the circumstances. It was the

current report by men that I believed to be truthful and had no interest in it other than that.

I knew George W. Reed. He had a farm about three miles from where I lived. It was in Reed's grove. His father 279 held a good deal of property in Will County and held a farm there. He inherited it from his father. I was acquainted with him as a young man, grown.

I taught school at Jackson's Grove. I knew William Gooding, the chief engineer of the canal, by reputation, not personally. I knew Mr. Matthewson, the surveyor on the canal, very well.

*Cross-Examination.*

I did not have to go to Chicago before going to Jackson's Grove. I went to Chicago in 1845. I went afoot part of 280 the way and got a ride with a man with a load of grain.

I followed the river part of the way on the west side. There was a wagon road. We met some teams. They hauled their grain by wagon. I don't think they hauled it by boats because they had no way of hauling them. I don't know that I ever heard of a boat going from Joliet to Chicago on the Desplaines with grain or merchandise, that is not about their going through the whole length of it, only this circumstance about the boatload of grain I was telling you about. That was common report at the time. I know something about the rivers. I crossed the river at one time, and only once I guess at the mouth of the Desplaines where it goes into the Kankakee I crossed in a buggy. In some places it was pretty deep and some of the places it was rather shallow. As to whether this boat came down the Kankakee and up the Desplaines river I couldn't tell you. I know nothing whatever about it except what some one told me. 281 There was a fording place there and they had stones marked out to show the drivers the current there. There is no other boat that I heard of that occurs to me now so directly as this one circumstance.

As to the men being drowned about June 8, 1847, I knew it only by report. I never was in the Desplaines river in a boat myself. They hadn't many boats on the river. The kind of boats I refer to when I say boats were called canoes or row boats. I saw some of them in Lake Joliet and down below there. They had a sawmill at the foot of Treat Island. I saw them working on a dam on one side of the

river to turn the water on the other side of the island for a saw mill. They used to have a mill there and we got our lumber sawed there at the mill. The dam was across only one channel. It was across the west side of the river.

282 I saw the relic of a mill at Treat Island in 1831. It had been abandoned; it was not in operation. It was a log mill. The dam at Treat Island only went from the island to the west shore. I don't think it went clear across the river. I first went to Treat Island in 1845 and was there several times. I went to Beardstown. I don't recollect whether there was a saw mill there or not. I never examined

the river down at Beardstown. I came here in 1844 and 283 in '46 I went to cutting lumber to build a house and got the logs in Trautman's grove and hauled them to Treat Island to the saw mill to get them sawed. There was a saw mill on the west side of the Desplaines river. There was the remains of a grist mill that was located on the east side of the Desplaines river. I could not tell exactly when I first heard about a paragraph of this kind in the book. I heard of a history of Will County written a number of years ago. I forgot who wrote it. I read some of it. I don't know that I read it through. I think I remember having read the passages that were read here about the boat. I don't rec-

284ollect at the present time any other boat that I ever heard of that ever attempted to go up or down the Desplaines with merchandise. I may not understand you. I think I heard of this accident with the boat, but as to whether that boat was going up and down the Desplaines river with merchandise, I couldn't swear positively as to that. As to whether it is a fact that this boat that had the oxen on it and the men was used for bringing stone across the river to riprap the canal and to bring employes across the river who were engaged in constructing the Illinois and Michigan canal, I couldn't swear positively as to that. I know that when they were building the dam across the Kankakee river that they had a boat that they hauled rubbles on, or stone and filling in for the dam. They had a boat they used to tow up the canal and river and across from one side to the other and then it froze and they had to put on a pair of horses and pull it out of the ice. I could not remember the precise date of the boat at Treat's Island; I was not interested. I could not say I ever went and saw the boat. I could not tell who owned the boat. I could not tell where it was going to or who built it. The boat in crossing the river got sunk.

285 JAMES R. FLANDERS, a witness for complainant, testified as follows:

*Direct Examination.*

I have lived in Will County all my life except when I was away in the army and at the university of Ann Arbor. I will be 62 years old August 27th. I have lived close to the Desplaines all my life. I was acquainted with the river as a boy from my earliest recollection. I hunted and fished on the river as a lad, in vacations went home there about the river and in '67 or '68 I had my first boat and from that time probably up to about ten years ago I used the boat 286 every year. My boating has been mainly from Joliet down stream to the mouth. The average depth from Joliet to the mouth (excluding the deepest places in Lake Joliet and Lake DuPage on the one hand and the extreme shallow point on Treat's Island on the other) would be from three to four feet. In Joliet Lake there are places I think 18 to 20 feet.

We used three classes of boats, canoes, flat-bottomed boats and clinker-built boats. I have gone down on flat-bottomed boats with parties of six or seven people and camp equipages.

On one or two occasions we had a large flat-bottomed 287 scow-built boat. It would draw loads from ten to twelve inches of water. We found that amount of water or more. A greenhorn could not have got through on account of the rocks. A man that knew the channel could go through with a boat in from a foot to 16 inches of water. It might possibly have been less in an extremely dry season. There are three shallow points. There is a ledge of gravel at Brandon's bridge and a shallow point at Treat's Island and another shallow point from a quarter to a half mile this side of the junction of the Desplaines and the Kankakee. Our party of seven went down in '68. I have been over the river since the flood of the drainage canal has been turned in, that is since January 17, 1900. There is very much more water since then, very much more indeed. I found at different times it was down almost to normal. That is when the water was shut off, when the three young men were drowned and 288 the water was shut off. They were hunting the bodies and it was said that it ran the lowest it ever ran. That



was about three years ago last summer. A certain amount of water has been taken from the Desplaines river for the purpose of feeding the I. and M. canal for many years. It is fed from the Desplaines river, from up above the Ruby street bridge; there was a projecting embankment there, projected out into the body of the river so as to divert the water from the river into the canal, and there was a foot-path and a bridge thrown across. It was one of the main feeders of the I. and M. canal and increased the water in the canal very perceptibly. For some little distance above that point the I. and M. canal and the Desplaines river coincided in their course. That was prior to any work being done by the Sanitary District. The canal was steered into the river, and then it was steered out again, and part of the river was steered into the canal along with it. Referring to this profile map, Joliet Mound was located about three-quarters of a mile north of Brandon's bridge (in Sections 18 and 19). The canal changes its direction when it approaches Brandon's road, so that people could hardly tell their direction unless they were posted.

*Cross-Examination by Mr. Munroe.*

When we took the boat with five to seven people it was put into the Desplaines river just below the Adams dam.  
291 We left the boat at Ottawa. We did not bring it back; we did not take it down for that purpose. We could have taken it back if we wanted to in the I. and M. canal. I have done that hundreds of times. We owned the boat and we had no objection except we were not looking for toil. We could have brought it back. I have been down on the canal and down on the river with larger boats than that. We could not rely upon the wind, although we had a sail, and  
292 there were rapids that we could pole by. We had to pole it. Anyone as skillful as an Indian might possibly have rowed it, a boat of that size, but in those rapids with two poles and two of us in it you could do it. There were three of the rapids we would have to pole the boat to get over the rapids. No, sir, we did not get out of the boat at any time. A greenhorn would get wrecked because there were rocks, some visible, others not, but there was a channel through them. He might not if he would sit right down and let the boat go down. I presume I have been on the river a hun-



dred times. Through neglect or mismanagement I have been caught on the rocks. One occasion I remember particularly we did not get out and pull the boat. We got out and  
293 the boat tipped over. That was at Brandon's bridge.

There was never any other point where I was wrecked. I should say the rapids near the mouth of the river are perhaps 25 rods up. I never regarded it as dangerous to go through those rapids. Of course a person must understand a boat and must know the channel. A person who did not understand the boat and did not understand the channel would be liable to get tipped over. I don't think it would be as hazardous down there at the junction of the Des-  
294 plaines and Kankakee as at Brandon's bridge. Since the Sanitary District water was turned in we took our boat in at Brandon's bridge and floated to the mouth of the Desplaines. I don't think it is hazardous in the present condition to go down the river if a person understands the  
295 boat. I never heard of any person being capsized on the Desplaines river since the drainage water was turned in.

I never experienced any great difficulty in going down the river to the mouth of the Desplaines. We generally came back by the way of the I. and M. canal, making a portage of about 20 rods in the canal. We never attempted to come up any great distance since the Sanitary water was turned in. The difficulty would be the swiftness of the current. I have seen the time when I could pick my fellow, we could not go up in race-horse time, but we could make it, give me Clement in the stern with two paddles.

Q. You have shown a very considerable knowledge of the Desplaines river. Assuming that dam number one was taken out and that there was no dam in the Desplaines river  
296 between Lockport and the mouth of the Desplaines river, assuming that the bridges were taken out, I will ask you would it be possible, in your judgment, for boats to go up and down the Desplaines river in its present condition to-day with those changes made?

A. Possibly for boats?

Q. Yes.

A. Yes, sir.

Q. To go up and down?

A. To go up and down. There is a fall from dam number one to South street to the south limits of about 35 to 40 feet. A boat could go up there without locks and dams by warping it up by snubbing posts along the shore, just

as they do on the Mussel Shell Shoals in Tennessee, but I don't think it is a practicable way. I think it could be  
297 done. You understand what I mean by warping. I remember the current reputation of the early use of the stream by people when they warped up the boat. Warping would not be limited to boats of small size. It would depend upon the amount of power. If there was water enough and power enough you could warp up a man of war.

Mr. MUNROE. I ask you from your opinion of this river to state whether or not the Desplaines river, if dam number one were removed and the bridge were taken out is suitable or adapted in its present state for carrying the commerce of this country adjacent to it without improvement or by means of locks?

Objected to as not cross-examination.

A. Oh, I don't think it would be without the construction.

*Re-direct Examination.*

Q. You have been asked on cross-examination to consider the river with the removal of all existing dams, otherwise not changed, and with the 300,000 cubic feet per minute of drainage water passing through it; now let me ask you, assume for the moment that the improvements which are outlined in  
298 the survey of 1905 by the United States Government which provides for ten dams with appropriate locks between the north city limits of Joliet and the mouth of the river were put in, with dams which are broad enough and strong enough and locks which were wide enough to accommodate Mississippi river craft of the largest size floating on the Mississippi river, that is the description of the report, I will ask you to state whether the Desplaines river under those circumstances would be capable of handling and carrying the commerce that is arising out of the territory immediately adjacent to it?

Objected to.

299 A. I think it would.

I have personally been present on a boat that was warped up stream in the way I have described. It was on the Tennessee river at Mussel Shell Shoals. One time during the service we took a steamer there. There were perhaps 300 of us there. There is a great deal of warping done. The men were on the shore helping do the warping. The method

consists of having a hawser at the bow lashed somewhere between the bow and the midships and it is taken up the shore, up stream, and made fast to a snubbing post or tree or any object that will hold. Then the nose of the boat is turned into the current and another hawser is made fast to the bow and as the boat sheers into the current it sheers off to the right if you are going north, say, and of course makes progress up. This rope that is made fast to the bow is hauled on until the boat is parallel with the line that is hitched first until it is right-angled with the shore. Then the boat is allowed to swing back to the shore and the process repeated. I have seen the boat go that way 40 rods at a time. That was on the Tennessee river, I could not tell how many times. I have made the trip down the St. Lawrence from Thousand Islands to Quebec by steamboat through the Lachine Rapids and the narrows of the St. Lawrence. And I have seen boats come back through the canal that runs right alongside of the St. Lawrence. They shoot the rapids going down and would come back by the canal.

301 OBADIAH HICKS, a witness for complainant, testified as follows:

*Direct Examination.*

Age, 78. I have lived in Joliet since 1862. My business was canal boat building principally. I carried that on in the old country before I came here. Was dry dock building in New York in '54 and '55. Came to Lockport in '58. Worked at canal boat building then. Came to Joliet in '62 and had a dry dock of my own here and worked at that.

Q. Were you acquainted with the local reputation as to the exploration and early use of the Desplaines River and the use of it by boats prior to the opening of the canal in 1848?

A. No, sir, only what I have heard others say.

Q. I asked you if you were acquainted with its local reputation from what you have been informed by others?

A. Yes, sir, some, because I was making inquiries about the stream in hopes that sometime it would be a ship canal and then I would have some of my business to do on it; that is the reason. It was general talk around the boat yards when I came up here, you know, about having this for a ship canal.

That was before the canal was opened. There was some boating on it, mostly trappers and hunters that came up through there. I observed that prior to 1860 there used to be more water in the river in the summer time than there was after that for some years. That was because the farmers 302 were draining their lands about that time everywhere by ditching and tiling. The tiling and draining dried up the sloughs and then in the summer there was no water in the river. It was lower afterwards than it was before the putting in of the drains. I have been fishing up there prior to 1860 when the water was two feet and some places four feet deep. After that in a very dry summer there was no water running through the river at Lockport. Of course there was plenty of water in the spring and fall.

*Cross-Examination by Mr. Munroe.*

I have seen it in a dry summer when there was no water running under the bridge at Lockport, two or three times. There was some water coming out of the back water that was running under the east bridge, but not under the west bridge at Lockport. The west bridge carried the channel of the river. I have seen it so low there that it did not go over the Jefferson street dam, sometimes, only just enough water 303 to feed the canal. It used to take all the water to feed the canal sometimes.

Q. Did you ever hear of anybody taking any grain or merchandise from Joliet to Chicago by way of the Desplaines river?

A. No, no, not till recently. I haven't heard of it.

Q. Who did you ever hear it from recently?

A. The papers, and some fellows that have been talking about the evidence they were going to give and so on.

Q. Who ever told you that they knew of grain being taken from Joliet to Chicago by way of the Desplaines river?

A. I couldn't say that, but I understood there was a cargo loaded in Kankakee and brought down to Treat's Island, a cargo of grain and they wrecked the boat there and lost the grain.

Q. But did you ever hear of a boat going from Treat's Island to Chicago?

A. No, sir, not of grain.

Q. Or with anything else?

A. Why, yes I have. Not to Chicago; but go to the headwaters of this river. I have heard of trappers' boats going up there.

Q. Going through the Desplaines river to the mouth of the river?

A. Not to the mouth. Up to the turn there at Riverside. They would go up there, they couldn't go any further.

COUNSEL FOR COMPLAINANT. He refers to the portage there?

THE WITNESS. The river turns and goes up to Wisconsin then you know. They would go as far as the turn.

Q. Who did you ever hear went up there?

A. I heard a man here in Joliet says he had gone onto the boats, and talked with the trappers and examined the skins on the boats.

Q. What was his name?

A. William Found.

Q. How do you spell his last name?

A. F-o-u-n-d. He is on the streets most every day.

Q. How old is he?

A. How old is he?

Q. Yes?

A. He is older than me. He is somewhere around 80 I guess.

Q. And the first time you heard about that was since this trial came up?

A. Yes, sir.

I have heard that the trappers used to be up around here.

I have heard others state that a good many years ago.

304 They were not canoes, they were bateaux. That is what they called them, a bateau. They were boats about 20 feet long and the sides of them were about three or four feet high and they had a little deck on one end, or a little cabin and they loaded their skins on there and put a canvas over them, generally, and they used to come up here to the big island, I understood, and stop there during the winter and trap and hunt there. They would go as far up the river as they could go and then have to wagon them to Chicago, put them on wagons, that is what I understood them to say. They would go up to hunt and trap all winter at the big island, so he told me, and then would go in the spring and unload them and then go back again down the river. That is not of my own knowledge. I was not here. In 1858 I came to Lockport. When it was dry a bateau could not go up or down the Desplaines river. There was plenty of chances to go in the spring and fall. They could go down fast enough and they

could pole them up, generally, and rope them up, and so on. They could pole them along the middle of the river. I never saw a fence across the Desplaines river, not right across the river, because it was always considered that the middle of the river was a navigable stream and belonged to the Government, and they were not allowed to put fences across the river.

Q. Who do you say contended that?

A. Why, I know of a case that transpired while I was in Lockport. There was two farmers owned some land that run down to what they called the big island there at Romeo and there was a tree grew right on the line fence, and one 305 farmer cut it down. Tom Williams was one and Robinson or Anderson the other. The other sued him and the matter was carried to Washington. Charles E. Boyer carried it to Washington and got a decision and his decision was that the tree did not belong to either of them; it belonged to the Government because it grew in a navigable stream. The old tree lay there for a good many years afterward. I got my information from ex-Surveyor A. J. Mathewson, the old county surveyor. He told me more than once, and he told me where the termination of the river was. Some man's house, he told me, I forget his name, whether it was Nickerson, or something like that, he had been over the ground and surveyed and knew all about it. He surveyed for the old canal and the Ogden ditch, and he was well acquainted with that. He told me that the Government reserved this river toward a link between the lakes and the gulf. Now, that is what I understood from Mathewson. Ex-Surveyor Noah Whitley also told me that he had examined the state records at Springfield and there was nothing to show that the Government ever relinquished its claim to the use of the river below Jefferson. It gave the canal authority to 306 put the two basins in here, but they were to keep it open perpetually for navigation.

*Re-direct Examination.*

I don't know who these trappers were working for; they were working for some company. They went all over down the river, I understood.

308 GEORGE ALBERT PARRENT, a witness for complainant, testified as follows:

*Direct Examination.*

I am sixty-five years old. Live in Joliet and have lived in Will County ever since 1853. Have been acquainted with the Desplaines river continuously since that time. Have gone upon it in boats. My last boat was 19 feet 10 inches long, 17 feet on the water line, 5 feet beam. It had a three-inch keel on the outside and it had a sail. I have carried 1,500 pounds of luggage, two men at 200 pounds apiece, they would weigh that or more, and a couple of hundred pounds of decoy ducks. I would go down twice a year, in the spring and again in the fall. From the early use in the spring to the latest use in the fall it would be about five or six  
309 months between. At the head of Treat's Island was the shallowest places. I have been through there two hundred times. We used to go pretty often. I have gone down there when the water at the head of Treat's Island was  
310 four feet deep on the riffles. At the shallowest place we could go up there with a boat drawing 18 inches of water. I have never seen any scows or float boats or boats of that kind on the river. I once loaned two boats to a man on the island to haul his hay off the island. I had two boats there 14 feet long; they were 27 inches wide on the bottom and 44 on the top. He put the two boats together and took a big load of hay off the island there. I know the location of Davidson's quarry. It is about a mile back from the river. There was a road connected it with the river. I used to see it before there was any bridge there. I have noticed the road in particular coming down where it touched the river. The road came down at right angles to the river and then a road branched off and went down to the round place at the head of the lake. Right there there was a deep hole. There was a well traveled road went right down to the place; it was filled up as a regular road. I noticed  
311 the road there in the fore part of the fifties, when a man was drawing a seine there. There was a big cove in there and the water was deep and at the point where the curved road came down to the water's edge it was five or six feet deep. There was no ford way or roadway across the river at that point; they couldn't get across there. It was



too swampy on the other side; they couldn't have landed. If they had driven in there they couldn't have got out and the water would have been too deep. The road from which this branched off did go out across the river at a shallow point. That road coming down to the river at the deep point must have been for loading material onto boats in the river, because there were stakes driven along the side. They said they had to be careful about the stakes when pulling in the seines. I noticed them, and it looked as though they were driving right along there for a dock there, a kind of landing place. I noticed it on account of the pulling in of the seine there. I couldn't say what they used it for, I never heard anybody say what they used it for. I remember the making of the deep cut by which the Chicago river was connected with and turned into the I. & M. Canal, back between 1867 and 1871. That has filled up the bed of Lake Joliet with mud and made it shallower than it was before. It naturally would, because there is no current in the lake.

*Cross-Examination by Mr. Munroe.*

I have probably owned forty or fifty boats on the Desplaines. They have been row boats, except this one that was a sail boat. The sail boat had a 16-foot keel, 19 feet 10 inches long, 17 feet on the water line, 5-foot bottom, 14-foot mast, 11-foot boom, 6-foot gaff. I used that boat on the river from the oatmeal mill down to the mouth and back again. George Abbott used to go with me in that boat and Sam Cutler. Cutler is dead. Abbott lives here. This trip went from Hickory Creek down. It drew 17 inches loaded. We went to the mouth of the Desplaines river, up the Kankakee to the first island. That was about the first of March. The creek was up; the river was not up so high. The river was about the same as it would be any time in the spring. We came back up over the riffles. We didn't have any difficulty in pulling it over the riffles. One man would get out of the boat and the others would stay in and keep it away from the shore, standing up with the pole. The other was on the shore pulling on the painter and that occurred right at the rapids at Treat's Island. We had to pull the boat that way probably 30 or 40 rods. We did not experience any other rapids that bothered us in our course. We came right along up the river. We brought it up beyond Davidson's

quarry there and then we pulled it out and put it into the canal because we couldn't get any further on account of  
314 the Jefferson street dam. We came opposite the oatmeal mill, just below Porter's brewery. We didn't pull it up stream from Brandon's bridge to the oatmeal mill or the dam, because we put the sail up and the wind was good and sailed along. You could sail it up now. We couldn't row it up very well. I have rowed skiffs up, but that boat was too large. Mr. Abbott went with me that trip. His three sons have gone with me on such trips. It was 1875 or 1876 that we made that trip with Mr. Abbott. I was over forty; I am sixty-five now. I saw this road down to the river about 1854 or '5. I was fifteen or sixteen. I was seeing the man seine; I was not drawing the seine myself. It was all open prairie then, no fences. I couldn't say whose land it was. The road was right there at the head of the lake.

(Witness is shown the township map, showing Lake  
315 Joliet, Patterson's Island and Brandon's Road.)

It was right on this bend (indicating). I was at least nine years old. It was a well beaten road. There was stuff thrown in to make it. I don't know, but I should not think it was used just to drive horses down to water. I knew all about it at the time; I knew there was a road there and I have always known it since and I know it now. I don't think the road is there now. I haven't been down there for seven or  
ten years. I could find it if it is there, if the snow is off.  
316 The ford that crossed there was right above the bridge, where the bridge is now. They crossed on either side, because there was a stone bottom there. I don't think it would have been as far south of Brandon's bridge, as ten rods. It would be too wide there. I have seen the ford there before the bridge was built and gone across it. There was no bridge when I was first around there. I have gone down the Desplaines when I did not have to get out and pole the boat along. I have gone down in June and did not  
317 have to take the boat out to get over the riffles. There was a young fellow with me. I have come up the Desplaines river at other times without having to get out and pull the boat up from Treat's Island up to the oatmeal mill. I cannot say from the mouth of the river. Yes, we rowed the boat right over the riffles. It was a light boat that only weighed seventy five pounds. I couldn't say whether we could do it today under the present condition of the water,

because I haven't been down there to see. Yes, it could be done today, and a motor boat could come up there today. 318 I have ridden in motor boats. They would go ten miles an hour in open water and five or six miles in the canal. I have gone from here to Channahon in it. I don't own a motor boat myself. Albert Keeling owned that. It went about five or six miles an hour when I rode in it. It was a ten-horse power boat, 36 feet long, covered in, with a full cabin. I don't think that boat could come up the Desplaines, because it didn't have power enough.

I have made an affidavit in this case. I don't think I said anything about hay being conveyed on the Desplaines river on boats in the affidavit, but I have seen men carry produce up and down there, I mean meal and flour, to cook. I don't know that I ever saw anybody carrying things on the Desplaines river to sell. I always took supplies when I went down the river hunting. I did not try to buy any. There 319 is a place down there at Channahon about two miles from the river where one could buy. There used to be a place at Dresden and another at Au Sable. You can't now. I have carried corn and wheat, but only in sufficient quantities to feed myself while hunting. I have carried a load of 1,500 pounds at a time, ammunition, tents, stove, bedding, decoy ducks, traps, rubber boots, beds, food; there were three of us. I did not take the hay off of Treat's Island. I let a man take my boats to get the hay off. Do you want to know where I took hay off? It was up in the DuPage river, in the summer time, that I let a man have my two boats to get it off. It was about a mile above Channahon. We would put the boat from the Desplaines into the DuPage by locking it into the canal at Channahon. We went down the DuPage river to fish. We went down by the canal. I have taken the big boat down to the DuPage river a good many times. I have been up the DuPage to Plainfield, two or three miles above Channahon with a small boat pushing; never had occasion to go further. I never took the big boat up Hick- 320 ory creek. We took it to the creek by taking the big rubble car from the house and running it down. I kept the boat on the dry land between the canal and the river, pulled it out every time with a block and tackle. I was down there looking for ducks when I saw them drawing the seine. They did not tell me to be careful and not knock the posts down. I think a man named Lampin said not to get into

the posts with the seine. They were talking to themselves  
I stood there and talked with them.

321 Thereupon counsel for complainant offered in evidence  
as Exhibit 4, an affidavit of Geo. Albert Parrent as follows:

STATE OF ILLINOIS, }  
COUNTY OF WILL. } ss.

GEORGE ALBERT PARRENT, of said county, being first  
duly sworn on his oath, deposes and says:

That he is now of the age of 65 years and that he has resided in Joliet continuously since the year 1853, and that from his first coming to Joliet and for many years thereafter he was much interested in hunting and fishing and indulged in the sport at almost all seasons of the year. That he went up and down the Desplaines river often in boats times as far up as the Goose Lake above Romeo, and down its mouth, that the same was navigable for ordinary boats the whole distance except when the same was obstructed by dams across it. That said boating could be carried on for at least six months in the year, and in some years all the year except when obstructed by the dams and by ice. That the said river was navigable for boats drawing from two to four feet of water from the head of the lake below Joliet to the mouth of the river at all seasons of the year except at the rapids at Treat's Island and they were about one hundred rods in length. That boats of like capacity could go up and down these rapids for at least six months in the year. That the river above the dams at Joliet was navigable at nearly all seasons for boats drawing at least two feet of water, the only obstruction being a small dam at West Lockport. That at high water the flats both above and below Joliet were so overflowed that like boats could go up, or sail there outside the current without the least difficulty except for the dams across the same. That after he came here in 1853 he remembered seeing a road from what is now known as Davidson's  
322 Quarry in Joliet to the head of Lake Joliet, and that that said road was then a well traveled road and looked like a stage road though the same had been used for hauling heavy loads over it. That there was not then any bridge across or over said

river nor was there any road leading from said river on the opposite or east side of the same. That this affiant was informed at the time that said road was used for hauling stone from said quarry to the river and loaded upon boats and taken down the river. That there was a deep hole at the place where said stone and other stuff were loaded and it was then plain to be seen where the loading took place.

(Signed) GEORGE ALBERT PARRENT.

Subscribed and sworn to before me this 8th day of January, 1908.

(Signed) W. W. STEVENS,  
*Notary Public.*

(NOTARIAL SEAL)

323 A man stood down there and told me that stone from the quarry was loaded on boats there and taken down the river. That was told me the same as it was about the abutments down there. I think it was later than 1853, somewhere along in 1854 or '55. He told me that was what the road was used for. The man stood on the aqueduct and told me things, too, about those men being drowned. The man stood right on the aqueduct and told me that that was there at the time. This road was built up with stones and stuff thrown in there. A man couldn't help but see it. These fishermen were there with us. I don't think there was a bridge

there then. I said in my affidavit the river was navigable for boats drawing from 2 to 4 feet of water from the head of Lake Joliet to the mouth of the river at all seasons of the year, except at the rapids at Treat's Island. There was never less than two feet of water at the mouth of the DuPage river. I never saw less than two feet at the mouth of the Desplaines. I say a boat could go up there

six months in the year, drawing two feet of water. That I know. It drew a good deal more than that sometimes.

We could get it up without going on the bank; of course it would have to be pulled. You would have to use the capstan; you would not have to put a post on the bank. You could put an anchor at the head of the riffles and threw a line out and pull it up, do it with a block and tackle. That would be three or four months in the spring and the balance in the fall, touching the lowest points.

326 GEORGE ABBOTT, a witness for complainant, testified as follows:

*Direct Examination.*

I live in Will County just outside the city. I am in my eightieth year. Was born at Keene, New Hampshire, in 1828; came to Will County in 1853. My home has been here since 1857. I have been acquainted with the Desplaines river ever since. I went hunting and fishing on the river in the fall of 1857; have been down there ever since up to within two years. I then lived right at the site of the Rock Island depot in Joliet; kept a restaurant there eighteen years. I would put my boat into the river right where Malcolm's 327 dam used to be. There is no dam there now. Most of the time I kept the boat at Patterson's Island, below Brandon's bridge. I have gone sometimes twenty trips in a year, sometimes more than that. Two years ago I went down clean through to the mouth. That was in the summer of 1905. In 1857 I don't think I went below what was called Charley Smith's bridge. I went on down to the mouth in 1858 and practically every year after that, and sometimes several times a year. The water was pretty shallow just at the head of Treat's Island. They had built little dams across each of the three channels and turned the water into the third, in to the race of an old mill. It was pretty shallow in the summer season. You could run a skiff over it a good many times after the fall rains. The water was a couple of feet deep near the Malcolm dam. In Lake Joliet it varied awfully, all the way from three to four feet to the 328 deepest place off Darcy's Bluff; that was 42 feet deep in high water. That was before the opening of the deep cut, when the bad water came in. Since the drainage water came down it overflows lots more country than it did years ago. I remember that just before the Chicago fire there was a cutting made that opened the Chicago river into the canal. They turned in a lot of sediment and dirt and killed off every living thing in the lake. I have been down there when it looked as though you could walk right off on the water for an acre with nothing but dead fish, because it caused the sediment and mud to accumulate in the lake. There used to be a ford just above Smith's bridge. I have crossed it with a buggy. If you knew the track the

water would just about come up to the bottom of the buggy, sometimes come in. You had to keep at the shallowest point to keep the water from coming into the buggy. In low water, in the summer season, I have been across there when it did not come in. I know where Joe's Island is. There was a ford there where you could cross when the water was low. I knew Shabbona, the Pottawattomie Indian Chief.

Q. What did he tell you?

Objected to.

A. He told me as to the French and Indian trading in furs up and down the river. I used to walk down with him Sunday mornings and he would stay at my house and we would walk down together as far as Patterson's Island. He told me about going up the river in canoes. I asked him what the canoes were doing up the river here. He said they bring furs, they brought furs and took them up to the big waters from here, at Fort Dearborn somewheres. I asked him how they could pull over these riffles and he indicated with a cane "poled up." That is all I remember. That was about the outbreak of the Civil War when Shabbona told me.

330 *Cross-Examination by Mr. Munroe.*

The water was sometimes high enough at Treat's Island to float a skiff over it; that would be in the spring and the fall when we had big rains. That would be on the side next to Glidden's, on the left hand side going down. Mr. Mills lives there now. I have taken skiffs up and down a great many times; I always got out and lifted it over the riffles. The riffles were very shalow most all the way from the head of the island to the foot. There were spots we did not have to take the boat up and down over them that distance. There were spots where the boat would run along and then in spots there would be a deep place right along and you would get in until you would come to a riffle and get out again. The boats I used on the river were the ordinary skiffs. There

331 was a pretty strong current below the oatmeal mill and a good many boulders. In that strong current and boulders it would be hazardous in low water unless it was daylight. There were boulders that would come up close to the top of the water, but a man that was used to the stream could tell where they were. It was not hazardous to go down



there in high water if you kept the channel. It is not so swift but what a man that understood handling a canoe could pole up against it. No, a man would not not be capsized even if he was not skillful in handling a boat, but he would turn  
332 around and go back toward the lake again. He is apt to go down in safety in high water. There were trees growing on this island and in high water the river spreads out and goes right through these trees, but a man going down with a boat would probably take the stream. There were three channels there. The current does not travel out through the trees. In high water any one of these channels would take a boat through. No, I do not think a man would be apt to go in among the trees and tip over, even if he didn't exercise great care. He would not do that if he could keep out in the current. There is a sand bar at the point where the DuPage river comes in. It comes kind of kittering down the river. Mostly you could float the skiff over the bar on the east or south side next to the DuPage. I have often stuck there. There have been times when you would have to get out and pole your boat along on the east side if you have  
333 a load. There were some rapids about 600 or 700 feet from the mouth. It was swift there, but it was swifter right below the mouth where they used to have the old dam. The water is deep enough below that for the boats. There are a good many big boulders in there. The water makes waves now, but in those days there wasn't so much water running down. It wasn't bad getting through. We used to bring our boat back up the river. We would get out and pole it and pull it. It was not difficult or tedious. I did not used to think so. Two years ago last summer, the summer of  
334 1905, I was down there. The drainage water was in the river then. We put our boat in right below the Rock Island railroad bridge. I do not think that there was any particular hazard to a man not skilled in handling a boat going down there. I did not think there was any particular danger until you struck close to the mouth of the river, where it is pretty swift, because it would suck and roll the boat. I remember we took five or six, three of them women, right down there. There were three men and three women and a little child in the boat. We pulled it over. We came back up the canal. It was too much work to come back up from the mouth. A man could not run a boat up from the mouth. I have seen men come up pretty strong currents. I couldn't

do it. (Age 78.) I have been on the Missouri for two years.

335 Q. I want to ask you from your knowledge of the Desplaines river, as it is to-day, and as it was when you were down there, the many times that you were, whether or not the river in its natural state and without improvements by locks and dams is capable of carrying commerce?

COUNSEL FOR COMPLAINANT. I object to any such questions as not cross-examination, the witness not having been offered as an expert on that subject, not qualified in that way, to enable him to express an expert opinion on a hypothetical case of the kind that is put, and that he is not qualified, and it is incompetent, irrelevant and immaterial.

Q. The current is such that no commerce could go up the river, in your opinion, is that so?

Objection.

A. I should not think so.

Q. When you were down there the depths of water were such it could not float any commerce?

A. Well, take it between Treat's Island and Patterson's Island, it ran all the way from three or four feet, but it is as deep as forty-two feet.

337 EDWARD D. BROCKWAY, a witness for complainant, testified as follows:

*Direct Examination.*

I live in Plainfield; will be fifty-nine years old August 9th. Was born and raised in Will County, about a mile from the river. I have been familiar with the river. I moved to Plainfield about twenty-two years ago. I used to hunt and fish and trap on the river and go on it a good deal from the time  
338 I was eight years old. I would be there every day in the fall until freezing weather. We generally either had a boat at Rock Run or kept one above, just below the old Joliet mound. Sometimes went as far down as Treat's Island and up as far as Patterson's and Brandon's bridge. I have forded the river with a team just at the head of Treat's  
339 Island quite often. We would go over there when gooseberries were ripe to get gooseberries. I have forded it when the water would come into the wagon box. Sometimes

it would be quite a bit lower and come up to the hubs. Sometimes I went there and couldn't get across, wouldn't risk it; it was too deep and I would walk back. Probably three times a year I would do that, as long as there were berries. That was from 1861 up until they cut off the bushes. My father came here twenty-five years before I was born.

Q. What did your father ever tell you about using the river himself before you were born?

Objection to anything his father told him.

A. My father told me about taking a flat boat down the 340 river from Peoria to Joliet. He said he got ten dollars for it and bought a cow with ten dollars. He told me this about two years before he died. He did not fix the date of the trip. He just spoke of it as a flat boat he took down the river. I suppose it would be 20 or 30 feet long, some- 341 thing like that. I know Davidson's quarry. There was a road there for awhile that went down to the river. I have been there and seen where it came to the water's edge. It was quite deep there, made on purpose for loading stuff onto the boats from the road. There were ruts in the road. There was no road on the other side of the river opposite where this landing place was. There was a ford back up that main road where Brandon's bridge is. I have forded it there in July and August. It would come up pretty near to the box in the lowest season of water.

*Cross-Examination by Mr. Munroe.*

342 The last I saw of that road was over forty years ago.

I first saw it three or four years before that. I was up there with a boat at that time, a kind of a flat boat, one that we made ourselves. It was not the kind that my father took to Peoria. It was a good deal lighter than that. I know a scow and a row boat differ. A scow or flat boat is a great deal heavier, built of heavy plank; on a scow the deck is built level, like that table. When I saw the road I think one of 343 my brothers was with me. He is dead. They had a road there to load the stuff onto freight it down to the quarry. That is what the road is for. They would freight it out to the quarry or Lake Joliet.

Q. And the road leads down to the water's edge at Lake Joliet and Miller's in from Lake Joliet, two or three miles

down, north of it, in that wide portion of the river, and they used a scow boat to convey quarry stone from Miller's?

A. No, they freighted material down to that quarry on the end of Mount Flathead, right where the Rock Run empties into the river.

344 It is probably six miles. A man by the name of Swalm run the quarry. Lake Joliet is  $5\frac{1}{2}$  or 6 miles long from Patterson's Island down to Treat's Island. It is a wide part of the Desplaines river.

It is not shallow. Oh, yes, there is some current. I have crossed the river at different points. I never saw a boat carrying merchandise or freight on the river, only this freighting of stuff down from the quarry. I heard from my folks about his sending the stuff down. I only heard of it the one year.

Q. Only one year, and to get his supplies in and open up his quarry, is that right?

A. Yes, that is it.

Q. And after he got his supplies in that was the end of taking any materials down?

A. Yes. He freighted derricks and such things down to save hauling them. That is all I knew.

345 ELIZA P. JONES, a witness for complainant, testified as follows:

*Direct Examination.*

My home is in Homer, Will County. I have lived in the county all my life. My birthplace was the house I live in. My father's name was William J. Paddock. Our home is about two and a half miles from the river, possibly four. Father came in 1836. I once went fishing on the river myself.

It was up near where Romeo is now; it was just before 346 the war, 1859 or '60. The young men got a boat and went on the river. They did not wade. The water was too deep. It was between three and four feet deep.

Q. Have you heard your father and others tell the current reputation of the history of the early days on the Desplaines river in the matter of shipping or travelling upon it?

Objection to any statement as to what she has heard in that regard.

A. I have heard my father say many times that supplies were carried up from the south as far as Lockport or up to here. When father came there was no canal and there was no railroad. I remember particularly of his speaking often that there was some man cornered coarse salt in Chicago, 347 and that all the way they were able to get it was down the river, and it cost them \$10 a barrel. I have heard him say that many times. That is the way I understood it. There was no other way to get it unless they went by wagons. That was long before the time when I went fishing. There was a Mr. Frederick Collins used to live there and the two old gentlemen used to sit and talk over old times and I have heard them talk these things over and over and over again.

*Cross-Examination by Mr. Munroe.*

Father came from New York State, walking and driving a one horse wagon to Chicago and across country to Homer.

He did not go down the river. He did not tell me that 348 he brought salt down the Desplaines river. He said it came down the river. I don't know that it was a fact that the supplies were hauled to Joliet from Chicago by wagons or that grain was hauled from Joliet to Chicago 349 by wagon. I know some grain was hauled that way.

That was after the canal was opened though, after they commenced the canal.

I have heard my father say that when the state became bankrupt that they had to haul their grain to Chicago. That was after they gave up using the river, I suppose. Father told me that when the state became bankrupt the canal was not finished, so they hauled grain by wagon, not much of it, only once in awhile a load.

Q. That was the only way they could get it there, wasn't it?

A. I think not.

Q. What other way?

A. I think they shipped it.

Q. By boat?

A. By boat.

Q. Where did you get that information from?

A. I inferred it from what my father said. All the grain in our vicinity was never hauled to Chicago.

I am sixty-three years old.

Q. You say that supplies from the south came up as far as Lockport?

A. Well, as far as here. I wouldn't be positive whether they came as far as Lockport.

I only know about supplies coming up from the south 350 by river from what I heard my father say. He said it came up on a boat. I don't know what kind of a boat, but supplies came up, and some came by wagons which they called prairie schooners. He said some came by boat. He spoke of fruit being brought up from further south because there was no fruit here. I understood him to mean Joliet. He didn't mean Ottawa. That is too far off.

352 SAMUEL W. JONES, a witness for complainant, testified as follows:

*Direct Examination.*

I live at Homer, Will County. Have lived there since 1866. The Mrs. Jones who has just testified is my wife. I was a soldier in the Union Army; I went into the service from Massachusetts. We made our home with Mr. Paddock, her father. He died some twelve years ago. I have heard from

Mr. Paddock and from old settlers the current reputa- 353 tion as to the history of the early use of the river.

Q. Just tell the substance of what it was you heard them say, as to the history of the early use of the river?

Objected to; hearsay.

A. I have heard Mr. Paddock and our neighbor, Mr. Collins, in talking over their early times, state that supplies were brought up the river by boat in an early day, that is, prior to the opening of the canal. I have heard them speak of having salt brought down from Chicago. They spoke of some fellow who got a corner on the salt and they had to pay an

enormous price, \$10 a barrel for the salt; it came down 354 the river, brought down by boat. I heard that from them before I went to live with Mr. Paddock. He talked about

those things after my living with him. He settled in 1836, and it was immediately after that, I understand, and he began to tell those things about the river after I became acquainted with him, and after that time made occasional allusions to it up to the time of his death.

*Cross-Examination by Mr. Munroe.*

The other man, Mr. Frederick Collins, is dead. He came here in 1832 or 1833. I heard these old gentlemen talking these things over together. They never talked about  
355 dams in the river at that time. I occasionally visited the upper part of the river, at Lockport and above. If I went to Chicago after I came here in 1866 it was by train. You must remember the railroads were here then. I would go to the river only for fishing or something of that kind. I don't think father went so very frequently, but he occasionally went. I don't think I heard them speak of themselves bringing things on the river. I don't think they confused the bringing of supplies by the canal, because they were talking about those early days prior to the opening of the canal. I don't think they were confused in that at all. I never  
356 heard father say he hauled grain in a wagon. I never heard him say why. They had their teams and they could haul it cheap that way. I heard them tell about  
357 hauling grain by wagon to Chicago. They never told me that all the produce was hauled that way.

358 DANIEL W. KING, a witness for complainant, testified as follows:

*Direct Examination.*

I am fifty-two years old and live at Plainfield, Will County; was born and raised there. Have always lived in Will County. I have lived within seven or eight miles of the Desplaines river. My home is below here. I have been on the river with men who came down from here in a boat. They would bring the boat down and we made hunting and fishing trips,  
359 making Treat's Island headquarters and camping grounds. My first trip when I camped at Treat's Island was 1872, in the fall of the year. We usually would have two men go in the boat down the river and two would hunt on the shore. They would bring in the boat a tent, a camp stove, stuff to last three or four days. Some of them were great  
fishers. I used the gun. I remember the shallow point  
360 at the head of Treat's Island. I never measured it, but we used what they called hip boots, tall rubber boots that come up to the hips. It would come within an inch and a half or two inches of going over the tops of them to ford there.



Of course we could ford it over all the time that I was there by facing up against the stream. If you turned sideways the current on those riffles there would take you off your feet. I made the trip only once that time, again the next fall and eight or ten years after that I used to make the trip quite frequently in the fall. I never made over one trip in the spring of the year. We usually used the same island as the camping place. I wore the hip boots and usually forded the river at this shallow point. It would never freeze up over the riffles. It would vary somewhat of course after 361 short rains but it would not vary very much, probably four or five inches. It would be from just above the knee clear up to the hip. I have seen it there when you couldn't ford it. That spring I couldn't ford it; it was too deep. I have been as far down as the aqueduct quite frequently. It was called "Dead Man's Hole" down there, around the curve. I don't know how deep; it was pretty deep I was told. I have gone down to within 20 or 25 rods of the mouth of the DuPage and then turned around and came back. I usually went on the bank with the gun. I got tipped over once or twice in the boat. I have heard from the early settlers the current reputation as it was when I was a young man as to the history of the early use of the river back in the period before there was a canal. I saw 362 flat boats there on the river and I asked them what they used them for and they told me they used them a little earlier to carry provisions on. One old gentleman told me there was a boat of grain brought there. That was before my time, when there was a brewery or something established there. I saw one or two of those flat boats in 1872 and I saw some of them later. They were not in use just then. They were anchored in the still water above Treat's Island.

*Cross-Examination by Mr. Munroe.*

They were anchored in the still wide water there; it was about 80 or 90 rods up above Treat's Island. The man 363 that lived up on the hill there, the old gentleman is dead. He told me they were used for carrying provisions. It was not specified from what point to what point. Those flat boats were, I should judge, 12 or 14 feet wide, 20 or 26 feet long, built up with a flap over the top here. I saw them two or three times after 1872. Al Robinson, Jean Robinson, John

Tyler and J. D. Schreffler were with me. There ain't any  
364 of them living. Sometimes we would take a camp down  
there and leave it five or six weeks. We always employed  
somebody to run the boat down here from Doc Folk's farm.  
Once or twice we brought my boat from Plainfield by wagon,  
but some of the boys here (in Joliet) would most always  
have the boats we used to hunt with. I never took a boat  
365 below Treat's Island, but the boys did, the ones that  
used to do the boating. I was tipped over in there once  
at the head of Treat's Island, what they call Deep Water.  
I don't know how it was. I don't think it was on account  
of the current. I guess the other fellow got floundering around  
a little bit and I lost my balance I guess and went out, that's  
all. No, the current was not swift there. On the riffles it is  
swift. Our fellows always got up and down with the boat.  
It wasn't too swift to take a boat up or down without get-  
ting out. I never done much with the boat myself. We had  
to face upstream in fording the river. The current was so  
swift it would sweep you off your feet. My friend was taken  
off his feet and went under, gun and all. I think a boat could  
go up, a boatman that understands running them; by shoot-  
ing different directions he could get through. I ain't any  
boatman. I have seen it done on riffles, but not on  
366 those. I never took much notice. These gentlemen on  
either side would come down and visit us and talk. These  
boats that I saw (in 1872) were the worse for wear. They  
might have been built, oh, five or ten or twelve years, it is  
hard to tell. They was water soaked, you know.

369 FRANK PADDOCK, a witness for complainant, testi-  
fied as follows:

*Direct Examination.*

I live in Homer, Will County, and have all my life. My  
father was William J. Paddock. It was a little over four  
miles to the Desplaines river. My father was living there  
from the time of my birth and before. He came here, I think  
he said, in 1836. I have heard my father say they  
370 brought supplies up the river.

Q. Just tell us what he stated?

Objected to; hearsay.

A. I asked him how they got supplies when they first came here. Well, he said they brought it in on boats. I don't know what kind of boats. He said that they brought some from the south and some from Chicago. He said they brought salt and groceries from Chicago. I have been on the river a short ways fishing in a small boat, three of us in the boat, from the Twin Locks, up north of the penitentiary, as far as Romeo, generally in May or June. There was a pretty good depth in some places,  $3\frac{1}{2}$  to 4 feet. I couldn't hardly say what it would average all other; considerably more than it would average now. I have noticed the falling off, which I supposed was caused by the canal and the land being tiled out, that it drained it off so there ain't so many feeders feeding into the river. The river itself has been used to feed the canal.

*Cross-Examination by Mr. Munroe.*

I was born in 1851. I will be fifty-seven next month. The canal was opened before I was born.

Q. When your father told you about getting supplies in here from the south and from Chicago by boat in the early days, did he not refer to getting those supplies in on the Illinois & Michigan Canal from the south and from above?

A. Well, that is what I asked him, and he said there was no canal in. He got it on the river when he first came here in '36.

Father used to go to Chicago once in a while. How he went before the opening of the I. & M. Canal I couldn't tell. I have heard of people going by teams. My father didn't mention the names of the people bringing in supplies. I never heard him mention any particular points from which the boats came, nor speak of a dam nor mention the boats going over the dam, nor how they were propelled.

Father came from New York. He probably came by way of Chicago. He came from New York with a horse and wagon all the way through. I have heard him say that. I have been on the river probably half a dozen times. I was able to get my boat along without getting out and pulling it at any place all of those times. I didn't have to get out any time I was there. It was about four miles we rowed against the current up to Romea. The last time was more than thirty years ago. I was a boy fourteen or fifteen when we

used to go fishing. Haven't since. I couldn't swear to measuring the water; we didn't pay attention to that. I know there was water enough so we could go with the boat.

375 EUGENE DALY, a witness for complainant, testified as follow:

*Direct Examination.*

Age, 82; born in Ireland; came to Will County in 1850. Business, cabinet maker and furniture store and undertaker. Place, Exchange street, between Canal and the river. I could see both from the windows. I knew Mr. Norton of Lockport as any young man would know an old gentleman. Had no personal acquaintance. I remember his mill for flour and meal. It was not in the same place when I first came; 376 then it was here on the river. Afterwards it was on the canal basin. The river was lower than the canal and the water from the canal got into the river. There was a tail race from the mill that carried the water to the river. Anything thrown into the race was carried on into the river. In those days farmers used to bring the corn in in the ear and when it was shelled at the mill the cobs were thrown into the race and carried into the river and a lawsuit grew out of it.

Daggett or Panton or both sued Norton for damages on 377 account of the cobs choking up the race. They were interested in the canal because their mill was lower down on the race.

It was common talk after this litigation between Norton and the other parties that they were fools to go to law with Norton because the state or United States had declared it a navigable stream. They got beat.

*Cross-Examination by Mr. Munroe.*

The common report around the streets at the time of the suit was that the river had been declared a navigable stream by the state or the government.

Q. By statute?

A. Yes, sir.

And that was the defense that Norton and Company 378 made to the suit, as I understood it.

The canal had been open for two years when I came here.

Q. And you never heard, did you, from anyone, at any time, that the river was actually used for the purpose of carrying commerce up and down?

A. No, sir, I never did; because at that time they were interested in the canal and they didn't care a continental about the river.

Q. I see. And you never heard from any creditable source that at any time the Desplaines river was actually used for commercial purposes for carrying commerce back and forth?

A. Well, no, but I think here that down below here, what we called Brandon's bridge, from there, that there was a town originally laid out there and that was known as the head of navigation, but how much navigation there was I don't know, but I know I have heard that frequently.

Q. I see. You have heard people say that?

A. Well, yes, sir. It was a common—so understood then; and I have read of articles by Mr. Woodruff and heard him speak of it.

Q. I see. Heard Mr. Woodruff and Mr. Stevens and others speak about that, have you?

A. They were speaking of the abandoned villages and like that. I have heard I think of four or five different ones that was in and around this neighborhood, that were abandoned, and it was in connection with that that this one down at what we call Brandon's bridge.

Q. Who ever told you that that was the head of navigation?

A. It came up in general conversations about those abandoned towns.

Q. Who with? Who was the party?

379 A. Oh, Lord, I couldn't tell how many. I know I have heardt Woodruff especially, because I see the articles—

Q. Do you recollect anyone else besides Mr. Woodruff?

A. No, I would not. I wouldn't know only from reading a communication that he had—

I have never been up on the river myself. I am no sailor. I have seen it from Brandon's bridge down, and seen boats on it. I couldn't tell how many I have seen.

380 CHARLES CLAY, a witness for complainant, testified as follows:

*Direct Examination.*

I live in Joliet, Will County. First came here in May, 1849. I lived at Lockport over haf a century. Have lived in Joliet this time now six or seven years. I was a carpenter, worked at boat building and repairing. The canal was through when I came here. I never saw any rafts coming down, but I heard of one coming down from away up near the Wisconsin line. I give you Dr. Daggett as my information. I never saw any. It was late in '59 or early in 381 '60 we were talking. I was at work fixing the mill that he owned, known as Daggett's mill. He told me he owned it all, had been to a good deal of expense, especially in the dam, and that he came pretty near losing it at one time. He said there was a man way up north that was coming down "and I heard several days previous to him getting there that he was coming down with a raft and I had gone to a great deal of expense in fixing up the dam and a good deal of trouble and labor." "Well," I says, "what would the raft amount to to you?" He says, "I would have to open my dam and let them through if they came down here." He said that this was a navigable stream, laid down on the United States map and the United States surveys. Well, that was something new to me. He told me when it was, but I couldn't tell the year now. It was something that happened further back; I judge it would be probably ten or twelve years or such a matter. He might have told me at that time how long it was previous, but I wouldn't remember.

*Cross-Examination by Mr. Munroe.*

The raft didn't come down. That is the funny part of it. He said fortune favored him that time. He said they got down with the raft somewhere in the neighborhood of Goose Lake and it struck something and went all to pieces there; he said he didn't have to open his dam for it.

No, he didn't tell me the raft got stuck on the ground and wouldn't float any further. The impression is that 382 it struck something, probably a tree or something like that and was broken to pieces, so that he didn't have to

pay for it. He said he would either have to open his dam or buy the raft or make some negotiations with the owners of it; on account of its being a navigable stream he had no right.

He didn't tell me about the Legislature passing a statute in 1839, but he said it was a navigable stream, so laid down on the United States map. He made no reference to the state statute. I have lived in Lockport straight along with the exception of a few months at a time. I was born in 1824, December 21st. That makes me last December eighty-three years of age.

I haven't been on the river except fishing. I have heard people tell about going with teams. I haven't heard them tell about the river. I have known its being used for commercial purposes by hunters and trappers. They had boats with a cabin on four or five feet high. I have seen boats 383 with cabins on the river up above Daggett's mill, between there and Lockport. I remember distinctly seeing two at one time. I couldn't state positively as to others. They were 16 to 18 feet long. I was four or five blocks away. There was a cabin so that a man could get in for room and take his hides and things. The Daggett dam extended across the river with the exception of a little piece. There was a small opening there. The bank was not exactly connected. I walked over on a plank. I was not there to see it built. It

extended across the river when at low water, but the 384 river would extend while overflowed, over the whole flat.

The river and all would be about half a mile wide there.

Defendant moves to strike out the answers on cross-examination as to conversations with Daggett.

*Re-direct Examination.*

These boats with the cabins on were in use in the fur business. There was a common reputation that the river was used in the fur business. They came up in the spring of the year. I saw them two or three different times. I wasn't interested enough in the river to know as to the raft. I heard it from other sources besides Dr. Daggett. It was general knowledge in the community.

385 In the early fifties I was riding into Homer with a farmer named Matt Weaver who fell from his wagon and broke his arm. He says, "Now, Clay, you go back to Lock-



port and get a horse and go over to Dr. Anderson's," but I couldn't get anybody in Lockport to loan me a horse, even for that purpose, not for money; they wouldn't let a horse go across them flats.

I have known sturgeons to be taken out there between sixty and seventy pounds weight. I don't know the depth of the water there exactly; probably four or five feet.

I was born in Nottingham England, and came to this country in 1848.

386 JOSEPH COUNTRYMAN, a witness for complainant, testified as follows:

*Direct Examination.*

My name is Joseph Countryman. I will be 67 years old this month. I was born in New York. I came to Will County when I was two years old. I have always lived here, except theh time I spent in the army.

I was two years old when I came to Lockport on the canal. I lived in Plainfield most of the time. I have seen the Desplaines river and been on it in a boat down and back a good many times.

387 Q. Did you ever see any rafts being floated down on the river?

A. I saw Jim Flanders', or something, I don't know what he called it,—a boat of some kind he had. I didn't ever see any logs or timbers floated down the river, or at any point along the river. I have seen skiffs and boats on the river. Some were 16 to 18 feet long. Flanders had one that was 8 or 9 feet wide, I should think by the looks of it. I saw him going down. It drew perhaps 6 or 8 inches of water. It was propelled by oars. Flanders had sails up. We didn't have sails on ours. We had a boat that we built to fish with. They had their equipment in, camp equipment and everything.

388 They had their tent and everything in.

Q. Do you recollect any other merchandise that was carried?

(Mr. Munroe objected to the question on the ground that the witness did not testify that any merchandise was carried down the Desplaines river.)

The WITNESS. I don't remember any goods they had on the boat besides the tents and equipment; and they were trapping, hunting and fishing, just for pleasure.

Q. Did they unload anything at any point along the river, —any freight—?

A. We didn't go to their camp. We had been down below and were coming up. I met them down below here.

Q. And you didn't see any loading or unloading yourself?

A. No, sir.

I have been down the river on pleasure trips several times. We came up with our boat the last time I was down there, from the mouth of the river clear to the Joliet Dam, and took it out here and loaded it into a wagon and took it home. In that boat we had our camp equipage and everything; three of us in a boat and a team going on shore.

I noticed the depth of the water in the river on that trip. Some places it was deeper than others. I could not say exactly how deep it was. There was in some places shoals down there. We had to get out and shove it by hand; we could not pole it up by poles, it was too swift. In the deep portions below the lake we found some. In the lake it was all right deep. We could not touch bottom there in some 389 places. In some places there was not much water and some place you could skip right down a-kiting, but you could not get back up unless you pulled up by hand. We pulled it over the worst places and then got in again. We could not pole it up, it was too swift. We had to pull it up. The water was deep enough, but it was too swift, and there was some places there was rocks sticking up. We had a boat about 5 feet wide and 16 feet long, made of pine. We had it made in Plainfield. We kept it for a good many years. There could four men and quite a lot of stuff ride in it. We put the stuff in it that we wanted to eat. We had no barrels. We had the stuff that we thought we needed while we were gone.

We went down there whenever the fishing season was—sometimes in the fall and sometimes in the spring. I have been down seven or eight times altogether. The last time I was down there was over thirty years ago. I took one trip down there since the war; the others were all before the war. I have not been down there until since that last trip, went down to Kankakee feeder fishing, with a hook; but

I made a number of trips before that time up and down the river.

390 I think there was a ford in the river at Treat's Island.

I did ford the river some places. At the ford it was not very deep, and some places up above your knees. There was rocks sticking up down there. If you found the channel you could go all right; if you didn't you get bumped.

There was a channel,—there was one ford at Treat's Island and three fords between here and the mouth of the river. I was familiar with each of them at that time. That was a good while ago. I forded each one and the water at some places was above your knees in depth.

Q. Did you ever see any boats on the river besides the one which you were in?

A. Why, I saw Jim Flanders with his craft down there. I saw lots more camping down there; who they were I don't know. There was a good many parties every little while. You would find camps all along the river. When we were there I would see camping parties, and boats.

Q. On which they had transported their camping utensils and equipment?

A. I suppose so. We had our boats with us.

We stopped several times going down. One place we 391 found Peter Bryan in charge of the camp. We was cooking there. I remember that well. We stopped there quite a long while with him. They had a keg of beer there. We stopped and had some, and we stayed there a while, and went on down.

They had boats in their camping party tied to the shore. I could not tell you how large those boats were; I did not take much notice of them. They had tents there; I don't know how they got there. We had no sails on our boat. The only boat I saw was Jim Flanders' with sails on. I could not tell you what these boats carried. I didn't go into the boats. I saw them when they were moving along. Most of the time I saw them when they were anchored on shore. They were camping on the ground; never took much notice; I didn't ask them what they had. Jim Flanders' was the largest boat I saw on the river.

*Cross-Examination by Mr. Monroe.*

Q. Mr. Countryman, there never was any boats on the Desplaines river to your knowledge, except pleasure boats, was there?

A. I didn't see any boats unless the boats that went down for trapping, hunting and fishing; that is all I saw.

Q. For pleasure purposes?

A. Yes, sir.

The last time I came up the Desplaines river was 31 or 32 years ago, the woman tells me.

392 I didn't see the Haven's dam in the river at McDonough street. There was a dam near Joliet. We pulled out boat out there somewhere near Jefferson street. We could see Joliet all right. We took our team out of the barn and loaded our boat and took it home. The only dam I ever saw was down below Jefferson street bridge in Joliet.

It may be that we took the boat out at the McDonough street dam. The first dam we came to, we took it out. I didn't know that there was two dams there. We took it out there and put it on the wagon and hauled it home.

Mr. Flanders that I spoke of is Mr. James Flanders, a lawyer in Joliet. He was raised in Plainfield.

We took our boat to Joliet Lake usually, left our team there, We only came clear up once. Left the team in the livery barn last time. I mean we only came up the river once with the boat clear up to Joliet.

393 I never was in the canal. I have seired down at the mouth of the Desplaines river. The current was not very swift when we were there. I hadn't been there for quite a long while. We used to own a seine, lots of us fellows; I remember swift water at the ford there,—pretty swift,—you could not row a boat up, you had to pull it up by hand. We took ours out and carried it over there. The water was too deep, so we could not wade, so we took it over the worst and then went on up again. We just carried our boat over the rocks there and then shoved it off into the current and then went on. There were other places where we had to carry our boat on this side.

I remember the rapids in the vicinity of what is now called Smith's Bridge, Whitmore's ford, near the mouth of the DuPage river. I was there.

There was only one place there, where we got out coming up here, and I could not tell which one it was, it was

so long ago. We got out and pulled it up, till it got too deep, and then we took it out on the shore and took it up. There was water enough there,—it was too swift. It was swift ing up here, and I could not tell which one it was,—it was the day I was there.

394 This boat I brought from Plainfield, I used on the DuPage river, and boated in the Illinois river too.

Q. You don't pretend to have an accurate recollection of the ford at this day, do you?

A. Not exactly.

Q. There might have been six or seven fords instead of three.

A. There could not have been but three. I have been across all of them.

Q. You mean to say you crossed every ford there was.

A. I have been right at all of the fords, yes, sir.

The first ford, taking the mouth of the Desplaines river and working up this way, is the one at Treat's Island. That is the first one I met coming up and I think I have been to all the fords.

Q. Well, there was two before you get to Treat's Island, Mr. Countryman, as have been testified to by people who lived there.

A. I camped at Treat's Island three or four times.

I could not tell you how many times I have been at the mouth of the Desplaines river; four or five times. We used to go seining and spearing. I owned a share in the 200 foot seine. At Treat's Island we poled it up and then waded and pushed it part of the way, and then the water got above our knees and we carried it around. There were lots of rock there.

395 Jim Flanders' boat I saw there was not an ordinary row boat. I could not name all the boats that I ever saw on the Desplaines river, because I could not recollect; I have seen quite a number of them.

Q. At one time did you see 500 or 5 boats on a trip down the river?

A. 500 would cover the river all over; I never saw 500 in my life, gun boats or anything else.

I have been down there on the river, when the one we had was all we saw some times; some times I saw a half dozen; I never counted them. I would only stay four or five days and go back home. I saw a good many of them little row

boats, not fishing boats. We called ours a fishing boat; it was not a rowing boat; was made on purpose for fishing.

*Re-direct Examination.*

I could not tell you whether these camping parties along the river obtained their supplies from distant points and brought them on the river or not. We took our with us to last us a week or ten days. I have seen fishermen's boats from time to time on my trips; supposed to be fishermen's boats. They were tied up in the camps. I have seen some of them rowing and some of them not. The fishermen's boats were larger than an ordinary skiff. You could not spear out of a row boat; you would fall out, it would tip up with you. Our boat was flat. If a man wants a boat to spear out of, he wants one that won't rock; if he does, he will fall out if he misjudges.

396 SAMUEL GATONS a witness for complainant, testified as follows:

*Direct Examination.*

My name is Samuel Gatons. I will be 67 the 9th of next April. I was born in York State, Rensselaer County. I came to this state in the fall of 1844. I came to this county direct. I have lived in this county ever since, excepting the time I was out in California. I have lived on a farm most of the time within three miles west of here.

I am familiar with a portion of the Desplaines river. Of course, I never was up and down the length of it. I am familiar with this portion here in Joliet and a little below.

I guess I was not more than five or six years old when I saw the first raft come down before there were any dams built up here, and I think before a dam was built down here at Jefferson street. Well, I was most too small to know at that time where these rafts came from. The timber was cut above there. It might have been at the sag and it might have been up at Lockport or somewhere that way. What makes me remember it, my brother came into the house, and he says, "There is a lot of logs coming down, two men on them," so we all ran out to the bank to see them. I think the logs were to be delivered to Philo Haven's Saw Mill.

It is down here about half a mile from here or one mile. 397 I couldn't exactly say as to the size of the raft. It might have been two or three or four or five lengths, but then there were two sections when I come to think of it. The next day another section came down and stopped above Jackson street somewhere. As to how many logs there were on the raft, that depends on the size of the logs the way they make rafts. They make them about fourteen feet wide, I think. I couldn't tell you as to whether this raft was in the general proportions or not, because I don't know. It looked as though there were a great many logs in it.

As to the depth of the river along the portion with which I am familiar, at different times of the year, of course, it would be deeper, at dry times it would be more shallow, it would vary in the dry times. Well, there was considerable water all the time running there in them days, probably more than there is now on account of the timber being cut all over.

As to whether there was sufficient water to float these logs at all times I couldn't say. It is like any river you know that is piled up with stones. When the water goes down it gets shallow in places.

I saw on the river nothing but a yawl boat; that looked to me like those boats they have in Chicago on the lake, them little boats; it was a trapper, a nice big boat, everybody was looking at it. There was probably one hundred on the bank wanted to see it. It was probably about sixteen or seventeen feet long. I should judge, maybe six feet wide. I have not any idea how much water it drew. I know we lived 398 right up there by Jackson street at that time, and he stopped there over night, and he showed us the furs that he had been trapping. He had come along from Wisconsin, up through there that way. I saw the furs on the boat. He was showing them to my brothers, a lot of steel traps and provisions, a tent and a whole outfit. There were provisions on it and boxes. Everything was boxed up, and then I saw several smaller boats after that, trappers. We lived ten years right up there at Jackson street. These trappers transported equipment on these boats. The boats were propelled by oars. It had a sail, now I come to think. The sail was lying down, the poles were in the boat. He didn't claim to have any difficulty in navigating the river.

I did try to ford the river up there by Jackson street. There were places there the stones would be piled up in the



summer time, probably not as deep as the table, about two feet and a half, that is on those riffles of course. There were holes that would take you over your head, five or six feet deep, scooped out you know. There were places that were deeper and the stones were washed and that would make it shallow, after the ordinary depth of water at those 399 places. As I grew up in years that was all the way I could judge from that there would be probably from eighteen inches to two feet or two and a half feet where we would want to cross. When it was that I saw the raft coming down was in the spring of the year. I couldn't just tell you that. It might have been April, it might have been later. I couldn't remember the year. I was too small, you know, to remember those things then, but I should judge I was probably six years old, six or seven maybe, not over that. 1841 I was born. I was three and a half years old when we came here, in October. It was before the opening of the canal. There were no dams at all from Jackson street down to Malcolm's dam at this time that I saw these rafts coming down. They had what they called a corduroyed bridge down here at Jefferson street, and if I am not mistaken I saw them swing that one time to let a raft through. It was loose you know. Had to pull it back to its place. I am sure these rafts came down before the canal was opened.

*Cross-Examination by Mr. Munroe.*

I might have been ten years old when the dam at Jackson street was built by the people. I don't know what year. I remember of its being built. My father worked on it. I don't hardly think I could fix the date when it was built. My recollection now is, when we came here that lock up there was built and the lock at Jefferson street I think they 400 were building. Dam No. 2 at Jefferson street was not built. There was an old dam there. There was a lock dam and I think it washed out. I am not positive because I don't know for sure. Of course, I was too young to pay more than a passing attention to it. It run over and run that mill that stood between the two bridges there. I couldn't say that was so when I came here, because all I could see was an end of it. It had washed out, but that was what it was there for. I was not old then. I was from say five to eight years.

I didn't ever go up to Lockport in them days. I didn't know there was a dam clear across the river just below Lockport. When I came here the canal was not opened from Joliet north. I guess it was pretty well finished. No, 401 there was no water up where the tow path bridge is. I think I can remember the bridge was not built when we came here. The summer after, I went with my brother and went fishing there. The canal was not open for navigation when I saw the logs. I know that fact because there was no dam there. There couldn't be navigation at Jackson street.

I couldn't tell you who else saw those logs, them that lived around here. I don't know where that yawl boat 402 was from that came down the river. I was pretty small. They took me by the hand.

Q. You do not pretend to testify under oath here absolutely as to the existence of facts which you think you saw at that early day?

A. Well, such things as that I would not be afraid to stand on them because I know I was very small. I am not accurate as to dates at that time. I have my age all right. I came here in 1844. I was three and a half years old. I was born in 1841. The canal was opened in 1848 or '9. I know I was just about a little lad when I moved up there to Jackson street. As to what part of the transactions testified to happened before I was seven years old I couldn't tell you the dates because I don't know. I can only remember seeing it. I don't think they happened after I was seven years old, because there were no dams there when this raft came there, the boats came there, and three or four of the little boats came there, not like the pretty boat; one of those red boats painted, a regular trapper boat. I rode on the third boat that came from Lockport to Jefferson street. I know I was very nearly pushed off, the crowd was so heavy on the boat. As to seeing a sail on that boat before I was seven years old, come to think of it I heard my brothers talking about it, and they asked him what he wanted to do with that on there and he said there was wide waters below. I suppose he meant that when he got in the wide waters it would go faster.

I didn't see any fences across the Desplaines river in those days. I have seen wire fences now.

Q. Where there pole fences across the river anywhere?

A. There might have been further down or further up.

Q. Were there some opposite the penitentiary?

A. I couldn't remember what was up there in them 403 days. I used to go up as far as Jefferson street and up to Jackson street. I am distinct in my recollection that those rafts, on which the two men were, that I saw on the river before the canal was opened, came down the Des-plaines river. I went out with my brothers. They took me by the hand, so I was pretty small. It was this side of Jackson street in the channel of the river. They were cutting timber to build that bridge too.

Q. How many feet south of Jackson street was it?

A. You can't get me into no feet because I don't know, It might have been ten rods south of Jackson street, that is where I saw the raft.

*Re-direct Examination.*

Those men were on it certainly, and they kept driving it around the channel. I can remember them running up and down it.

*Re-cross Examination.*

I don't think Dam No. 2 was in the river then.

Mr. MUNROE. I want to have the records show that when the witness signs the affidavit for a witness fee he was reluctant in doing so, and that he said he was too young to remember the circumstances exactly.

404

*Re-re-direct Examination.*

I am sure and distinct in my recollection in regard to the movements of this raft. It occurred before that dam was built up there, and before the canal was opened, and what I said about the depth of the river at the various fords is what I know from my own experience, when I was ten or eleven years old. After I was thirteen or fourteen years old I went out on the farm. After that, I don't know much about Joliet.

405 JOHN W. TAYLOR, a witness for complainant, testified as follows:

*Direct Examination.*

My name is John W. Taylor. I am in my 78th year. I was born in New York. I came to Illinois in 1837. I have lived near the Desplaines river, right along here ever since,—excepting along in 1858, I think I was in Wisconsin about a year. That was the only time I was absent, and during the war.

I am familiar with the Desplaines river, and have seen it in all seasons of the year and many years. I seen logs come down the river in some shape. Sometimes probably in small rafts, and sometimes scattered. I have seen them in the river. I don't have much particular recollection about them though, but I seen them in the river floating down.

I never saw any in the river before the canal was completed, or I mean after the canal was completed, principally before; along about,—might have been '45, '6 or '7. I am sure in my recollection that the rafts did come down before the canal was opened; '45 to '47, I would not state particularly just what years. I used to see them frequently in the river and logs coming down in some shape. Well, there 406 might have been probably a dozen logs pinned together there, or such a matter. I don't know where those logs came from; I don't know in particular where they went to.

I know they have a boom there at the dam, where the logs were held, that must have been rafted there. Used to see logs there in this boom very frequently in the river. They were there just above the dam, at the saw mill, and ready to be used there.

I did not ever see on the river anything more than row boats, skiffs and such like boats. I have been on the river considerably myself,—in boats, row boats; built one here; built one after the canal was built, but before that I was very frequently in boats.

I was familiar with the depth of the river. I don't remember that I ever saw the river at a lower stage than 2 feet, at its lowest stage. I was very frequently in the river wading it and swimming it; and along the banks of the river as far as Channahon. I forded the river a good many 407 times.

I did not ever see any boats carry anything on the river.

I seen boats come up the river here that were said to be travelers' boats, or probably fishermen's, but I never saw any freight carried on the river. I saw evidence, I think;—there was traffic somewhere. I know of the general talk or reputation in the neighborhood as to the navigability of the river. It was generally considered by everybody of the old inhabitants as being a navigable stream. They always regarded it as a navigable stream. This was long prior to the opening of the canal. That was about 1848, so that it was generally understood in the community that it was a navigable stream.

I was better acquainted with the river before the canal was opened than after. I am pretty sure in regard to the depth of the water, because I was in the river more or less pretty well down. Rafts and boats of various kinds had no difficulty in moving up and down the river. I don't think

I recollect any conversation about building a bridge over the river. I know in an early day there were two instances I knew of bridges being carried off by the water. The two bridges on Cass street were carried off by the water.

I don't know of my own knowledge of any traffic on the river, only, I said, what I thought was evidence of it. I lived in Channahon about a year or such a matter along in '43, and I used to see cordwood piled up on the banks of the river on that ford, that I know must have been landed there, I think from some boat, because there was no timber anywhere around there. This cordwood was not brought there by boats to my knowledge, but it must have been brought there, because there was no timber near the ford. I know the people of Channahon cut their wood at the lake. I know a man was drowned in the lake, in crossing the lake, in the spring of the year, while he was cutting wood there at the lake. I think on the left bank of the river the wood was cut there generally. There was good heavy timber there. This wood must have been carried away in boats, I think.

Mr. MUNROE. I object to the rambling of this witness.

The WITNESS. I never seen any boats or anything like that carry any merchandise, but have seen the floating of logs, rafts, etc. That occurred before the canal was opened, and I know that.

409

*Cross-Examination by Mr. Munroe.*

I came from New York. I came directly from Ohio here. I came up through Vandalia. I was in my 7th year when I got here, in 1837. I was up in Chicago, I think, two or three years before the canal was opened. I got there with the horse team. I met people on the road, going and coming. There was quite a traffic betwixt these places and Chicago at that time. There was not any other way of getting goods between these places and Chicago except by team, that I know of,—nor any that I ever heard of. I have been to Channahon on the road. I lived in Chicago between 1 and 2 years.

There was no wood near this ford in the vicinity of Smith's bridge. On the opposite side of the river from the Channahon side, I think there was timber.

410 Q. Do you not remember that there was also a bluff on the west side of the river, that is to-day heavily wooded?

A. It must have grown up since then. Well, there was a little timber, I think along the DuPage river at that time from Channahon down. I never heard of a boat being on the Desplaines river, carrying freight or merchandise.

I never lived in Lockport. Well, I lived in Joliet, in a house that stood pretty near where the Rock Island station is now. I didn't know that since 1839 the State Legislature passed an act declaring that portion of the Desplaines river navigable which extends from the upper basin of the Illinois and Michigan Canal to the Wisconsin State line. I never heard of that.

Q. When the people treated or discussed the river as a navigable river, do you know whether or not they had in mind that act of the Legislature which declared that river navigable? You don't know whether they did or not?

A. But it was generally considered by the people here at that early date,—not only they considered it, themselves, but the Government considered it a navigable river.

Q. All you know about that is what you heard the Government claim?

A. Yes. It was discussed here and talked about by the people.

These rafts that I saw were along from where I lived, generally. I lived for a time on Bluff street, and had a good view of the river, and I think it was not a great ways from

Cass street that I saw these rafts or logs, north of Jackson street.

Well, I know I saw these logs before the opening of 411 the canal, because I was not as familiar with the river after the opening as I was before. I didn't move away from the river, but I didn't have occasion; I was not sometimes steady in town. I worked in the country sometimes after the canal opened. I didn't have any occasion to haul any produce or supplies from Joliet south, or from points south of Joliet north. I did not know that goods coming from St. Louis came as far as Ottawa and then were hauled by teams from Ottawa to Joliet. I never heard of it. I never heard of anything coming from the south, excepting apples, peaches and things like that. They were fetched here in wagons, not from Ottawa, but from the farms down south,—down from the central part of the state, the southern part of the state.

Q. Do you remember that the stones for the locks at Marseilles were hauled from Swain's quarry in Joliet to Marseilles?

A. No, I don't recollect that particular. I recollect Swain's quarry at the time it was opened. I recollect Swain's doing business here.

All the business I knew of was between Joliet and Chicago, and the teams were coming and going every day all the year around.

412 WILLIAM R. TIBBALS, a witness for complainant, testifies as follows:

*Direct Examination.*

My name is William R. Tibbals. I live in Dubuque, Iowa. I have lived there since March, 1857. I will be seventy-six years old the 27th day of next month.

Since then the greater portion of the time I have been a captain and pilot on the Mississippi river between St. Louis and St. Paul. I first commenced navigating the upper Mississippi river in 1854. Have had government license as a pilot ever since I went there. First received Government license in March or April, 1855.

My duties as pilot were to navigate the boat I was on and



determine its course, and the crew were subject to my 413 orders as far as navigating the boat was concerned, and in handling of the load they were subject to the captain and to me when I was captain.

From the time I received this Government license I navigated the Mississippi river and the St. Croix river as a pilot. I became the United States Supervising Inspector of Steam Vessels of the Fifth Inspection District in February, 1895, and served four years. I was appointed by President Cleveland. The Fifth Inspection District embraces from Keokuk, Iowa, to St. Paul, Minn., and the part of Lake Superior that borders on Wisconsin, and the tributaries of the Mississippi between the points named. That included the Iowa and the Des Moines rivers. There was no steamboats on those rivers at that time. Also the Wisconsin, the Chippewa and the St. Croix rivers were in my district, and 414 navigation was being prosecuted upon them at that time.

It was necessary for me to examine the vessels actually operating and which were applicants to operate on those streams during the period when the local inspectors were not there, but I was in charge of the district and had two sets of local inspectors in my charge when located in Dubuque and Duluth.

The water and channel conditions on the Mississippi river when I went on the river in 1854 was such that we had no serious trouble at all. In 1855 the water got very low and we had a good deal of trouble with the new boats that were built and came out that spring. In 1855 the depth of the low water that I referred to was between Lake St. Croix and St. Paul about 26 or 27 inches, that is about 30 miles of water. We had some boats that navigated the Mississippi that would draw from 12 inches to 3½ feet. I was referring not to one boat,—12 inches being the empty and the 3½ foot, the low,—but was referring to two vessels, which were light and without any load. A vessel which drew 12 inches of 415 water when unloaded, when loaded to its capacity would carry about 80 tons of freight. It would be from 120 to 130 feet long and about 30 feet beam, and would draw when it was loaded about 3 or 3½ feet of water, or somewhere between that. The larger vessel, which drew 3½ feet of water when loaded to its capacity would draw about 6½ feet and its load would be between 800 and 900 tons. That boat would be about 235 feet long and she would be 37 feet beam.

Before I went on the river I lived in Galena, Illinois. I went to Galena in 1852 and I knew that they were running a boat from Galena up the Wisconsin river and saw her every time she went in there, and after I went on the river I was conversant with her. That boat was called the "Enterprise." She would draw when she was light, I should not think, over 10 inches, perhaps less than 10 inches, and when

loaded she would draw from 28 to 30 inches. She would  
416 carry 75 tons of freight. In her ordinary operation I should think she would carry between 60 and 80 tons. When she was light, without any load, just her fuel, she would draw about 10 inches, somewhere, about 8, 9 or 10 inches; and when fully loaded she would draw 30 inches, perhaps  
417 more. She was a boat that had about  $4\frac{1}{2}$  hull,  $4\frac{1}{2}$  side.

She was what you call on the Mississippi river a "Gunnel-Boat," and she had straight sides, about 4 feet, and they could load her clear to safety so they could make her draw nearly 4 feet of water. The depth to which she would descend into the water would simply depend upon the relative amount of the load; and it would fluctuate between a draught of 30 inches and a draught of 8 inches.

418 There were several boats that ran up the Iowa, from a little place in Iowa called New Boston. The Iowa river comes out at New Boston, and they went up the Iowa river to get their freight and deliver it at New Boston, to be taken by the through boats to St. Louis.

Two or three different sized boats ran there. Their draught would run from 12 inches to 18 or 20. They were tow boats, towing barges themselves. They did not put much freight on them as a rule; that is, they kept them as light as they could, so that in case their barges got into trouble they would have room to work.

In operating one of these boats, they put a barge on each side of her and made them fast, pretty well forwarded. It really pushes them. They would have to hitch the two boats into them far enough to make them solid.

Their loads consist of sack corn, and I have known of them bringing out 3,000 sacks on a trip,—about 1,000 sacks on each barge, and about 1,000 on the boat. The draught of a boat carrying such a load would be about 3 feet, and the barges would draw but 2 feet.

Q. You may state, Mr. Tibbals, if you know it to be a fact, if it is a fact, whether or not it is a fact that commercial navigation is carried on streams of water in different

parts of the United States, drawing less than two feet of water?

A. Yes, sir. I have steamboated on the Mississippi river on fourteen inches.

The Moline chain of rapids is on the upper rapids, extending from Rock Island to LeClaire, a distance of about 16 miles. It is right opposite the Town of Moline, and a

steamboat man would speak of it as being the swiftest 419 water on the river. The rate of the current there was from 6 to 9 miles per hour. I have navigated through

there before there was any improvement made there. I never knew of a steamboat that tried to go through there and did not get through. At the same time I have known them to have to lay at anchors and work themselves through. They would cordell some of them. I was on one boat they had to cordell. The method of cordelling was to put out a 600-pound anchor, which would catch in the bottom of the stream, and then wind the line up on a capstan and pull 420 the boat up. When they got the boat up to the anchor,

they would repeat the operation. I have done that on the lower rapid at Keokuk, and it was also used on the rapids in the Mississippi, called the Smith chain, which is swift water too, but not as bad as Moline.

Q. Now, I will ask you, Mr. Tibbals, to take the case of a river which, for a period of four or five months each year, exclusive of the time she was frozen over, and exclusive of the time of extreme low water, presented a depth of water which would range from 18 inches to 10 feet of water, in a channel which would range from 250 wide, to a quarter of a mile wide, and which had a current which varied from an almost imperceptible current in some of the wide spots where it was a quarter of a mile wide and ten feet deep, to a current much of the way at two and a half miles an hour, and which would ascend to three and a half miles an hour, and in one or two places to five miles an hour, and in one or two places to seven and seven and a half miles an hour, the swiftest current in one instance being in a shallow part, and in another instance being where the water was somewhat deeper, but not up to the large depth, I will ask you to state whether or not, in your judgment as a navigator, that stream would be a navigable stream?

COUNSEL FOR DEFENDANT. That is objected, to, if the court please, as incompetent, irrelevant and immaterial, and it does not state, if it is intended to include the Desplaines, it does

not state the physical facts and conditions there with enough accuracy.

THE COURT. What fact is left out?

COUNSEL FOR DEFENDANT. One important fact is the slope to the river and another is the bend in this stream.

421 THE COURT. He may answer the points—he may answer first whether the questions of slope and bends in the stream would or would not affect any answer he might give.

A. Well, I don't know that I exactly understand the situation, and if I understand the question.

COUNSEL FOR COMPLAINANT. I submit in regard to the slope, if your Honor please, that the slope in so far as important, is important in producing the velocity or current in the water, and, having given the velocity or current of the water, I have covered that feature, and if the bends in the stream are important, I have here, if your Honor please, a map which has already been introduced in evidence, and one which is a certified copy of the Government record, and this is the one that has no annotations of any kind upon it, but just as it comes from the Government, and it is drawn on the standard Government scale of two inches to the mile, and I am perfectly willing to incorporate into the question that the stream is a stream such as is shown you on the map before you, which may be called McCullough Exhibit 1, and which is drawn on the scale of two inches to the mile; and the particular part of the stream we are interested in is from Joliet to the mouth of the river and the bends are such as are shown on this McCullough's Exhibit, which is drawn upon the scale of two inches to the mile.

COUNSEL FOR DEFENDANT. Does your question still stand?

COUNSEL FOR COMPLAINANT. It does. I have embodied this other.

COUNSEL FOR DEFENDANT. There are other objections.

THE COURT. Yet us have them all at one time, Mr. Porter.

COUNSEL FOR DEFENDANT. Of course I could write out a hypothetical question that I think would be proper.

THE COURT. You can put that on cross-examination.

COUNSEL FOR DEFENDANT. This witness cannot tell any supposed examples, unless he knows the declivity of the river.

THE COURT. That has been given.

COUNSEL FOR DEFENDANT. And between the points where navigability is supposed to exist. It might be the frequency

of rapids or ripples or shallow places. This supposed  
422 stream may have a light current in one place and a greater  
current in another place.

The COURT. You may state, after having heard the objection of counsel, whether you are competent on the hypothetical question as put to you by Mr. Starr, and without further information bearing on the point, suggested in the objection, to answer the question whether such a river as stated is or is not navigable?

A. As Mr. Starr asks the question, I would say, yes.

The COURT. That is you would say that any river which answers the description given by Mr. Starr, irrespective of anything else—

A. Yes, sir.

Q. No matter what else you might add to it, it would always remain and be a navigable river?

A. Yes, sir.

*Cross-Examination.*

I have knowledge as to the rapidity of the current of the Moline Rapids, not as an engineer, but I was connected with the United States Engineer's office at Rock Island for seven years. I was navigating over the rapids and I was with them and heard the conversations in the office and heard the engineer that used to work on the rapids. The Moline Rapids are not the same rapids as those referred to as the Des Moines Rapids. The Des Moines Rapids are at Keokuk, the foot of them; the head of them is at Navoo, Illinois. The Moline Rapids commence at Rock Island and Davenport and extend to LeClaire, about 16 or 17 miles. The Rock Island Rapids are the same as the Moline Rapids. The slope of the water I do  
not know well enough to make a positive statement. I  
423 know they are pretty swift, that is all. I have doubled  
the trip a good many times over the rapids; that is, towed  
part of the load and then went back and got the other part.  
I have navigated these rapids before they were improved.  
The improvement was made in 1877. Before the improvement  
was made it is not true that a good portion of the time it was  
dangerous, if not impossible, to navigate these rapids. It  
never has been in my time. I always got over the rapids.  
Of course, there is more water now.

424 WILLIAM H. BING, a witness for complainant, testified as follows:

*Direct Examination.*

My name is William H. Bing. I live in Cincinnati, Ohio. I am a steamboat captain and pilot. I have been engaged in steamboat work and business since 1873. I was licensed by the Government as a pilot on the Ohio and its tributaries and have continuously followed the business of navigating the Ohio river and its tributaries from the year 1873 up to last December. The tributary streams of the Ohio which I have navigated are the Great Kanawha river and Big Sandy river, some on the Kentucky river, and have navigated the Ohio all this time, almost altogether. Not very much on the other rivers.

The run which I have made on the Ohio river most frequently was from Pomeroy, Ohio, to Louisville, Kentucky.

Referring to the Ohio river and the depth of that river  
425 at high water,—I seen it seventy-one feet, at Cincinnati;

and I have seen the river as low as twelve inches; twelve to fourteen inches, near Pomeroy, Ohio,—between Pomeroy and Ironton. There are several shoal places there that go down to about twelve inches; I don't just recollect what year it was now; it was years ago. It is a frequent thing for the Ohio river to have those very high floods and those very low water periods,—every year. Most every summer we have about as low as three feet, and sometimes under the three-foot stage. When I said twelve inches, I meant twelve inches only in chutes,—what we call chutes,—in the deepest part of the shoal place. A boat going down through that river runs over

the one foot of water. They cannot use the big boats,  
426 and when we cannot use the larger boats we generally use the steamboats used in the small streams. They navigate and carry freight on those small stages of water. It is not, maybe not more than once in eight or ten years, when it gets that low; but I have steamboated on little boats when the water was only twelve inches in the river. We carry light freight and passengers. You couldn't carry over eight or ten tons on that low water you know. The little boats would probably draw five or six inches; they were not built very wide, you know.

The dimensions of these boats that would navigate on the

twelve inches of water and carry freight were about 100 feet long, 90 to 100 feet long, and about 16 to 18 feet wide, with a little flat bottom, square bow,—or the kind of boats on the Ohio river.

They have put in dikes and dams, which helped the channel considerably from what it was. I ran over it there before the improvements were made. The 12-inch water was before the improvements had been made.

427 On the Kanawha river the dimensions of the boats which we used were something like the boats that were in the Big Sandy river,—the ones I have already described; something of that class. I have navigated that kind of boats on the Kanawha river,—about ninety to 100 tons being their capacity. I have seen it as low as ten to twelve inches on the Kanawha; I have been on small boats there and could navigate on that twelve inches and carry light freight. We generally have low water, through each year, but probably not that low. When it got down to two feet we would call it low water. Before they had improvements there, it did go as low as that annually. It got as low as six inches at 428 Charleston, West Virginia, on the gauge, but the gauge is always considered a little less than the water is. About ten inches in the river. It would run ten inches to three 429 feet at low water. From 18 inches and 2 feet—along there—I have run there when it was that low. I made on the Kanawha in the years that I was running on it about a couple of trips a week, for three months each year. The 430 most of my work from—over the Kanawha was on tow-boats and took up empty barges; just shoved the barges up to the mines. They did not draw over ten inches, six or eight inches. We loaded the barges to six feet or six to 431 seven feet. Loaded them with coal, ten or twelve thousand bushels of coal on the barge,—and we would bring out six or eight or ten of them, one steamboat.

I have run on passenger boats up there that were about 150-ton boats, about the largest sized boats that run in the Kanawha river,—when I was working there, in all kinds of stages, from 15 feet to 20 feet, during that time. The boat that I was on would carry, I suppose, very near 200 tons, all of 100 tons, on three feet of water. I have seen and used boats on the Kanawha river whose capacity would be less than 100 tons; and size about 90 to 100 feet long and 16 to 18



feet wide,—about that sometimes. On three feet of water they would carry from thirty to forty tons.

432 Boats of that size and tonnage were of frequent occurrence upon the Kanawha river engaged in commerce. When I steamboated there they had a great many what they call chutes there, strong currents, walls built up, and the channel close to the walls, and the current I suppose would be an eight or ten mile current. I navigated through that current, and the capacity of the boat would be about ninety tons, and the boat was about half loaded.

433 As to how the current of eight to ten miles an hour affected the operation of navigating boats with freight, going down the current takes the boat along; all we have got to do is keep it in the channel; going upstream it is pretty slow. Sometimes we have to lay in line and warp through those strong places when the river is down low. We take and lay an anchor above over the shoals and put a line to it, and have a nigger running by steam; make a capstan and wind them. We call a capstan, in local parlance, a "nigger." The boat was loaded with this half load of freight when hauled up in this manner.

Q. I will ask you to state, Captain Bing, to take the case of a river, which for a period of from four to five months each year, exclusive of the time when it was frozen over, and exclusive of the time of extreme low water, presented a  
434 depth which would range from fifteen to twenty inches of water in the shallows, and up to ten feet and more in other parts; and in a channel which would range from 250 feet wide up to a quarter of a mile wide, and which had a current which varied from an almost imperceptible current in some of the wide spots, where it was a quarter of a mile wide, and ten feet deep, to a current much of the way up to two and a half miles an hour, and which would increase to three and a half miles an hour, and in one or two places to five miles, and in one or two places to seven and seven and a half miles an hour; the swiftest current in one place being in the shallow part and in another place where it was somewhat deeper, but not up to the large depth,—I will ask you to state whether or not in your judgment and opinion, as a navigator, that stream would be a navigable stream, assuming that it had such windings and bends as are indicated in the river which is shown upon the McCullough plat which is before you here?

I will add to that, that you may include in the conditions, that there is a stretch of nearly a mile where it passes an island where the width is less than 250 feet, and in one part goes down to nearly sixty feet; that the area of the imperceptible current, or very low current, is in a strip of the 435 river between five and six miles, and where the river runs very nearly straight without bends, and is about a quarter of a mile wide, and that there is another place in the river where the current is very sluggish for about a mile, where it goes around a rather large bend and where the river is from three to six hundred feet wide as it goes around the bend; that the swift current of seven and a half miles is confined to an area not exceeding a mile or a little more, less than two miles in length.

439 A. I would say that it would be a navigable stream.

COUNSEL FOR COMPLAINANT. What depth would you say, as a navigator, would be sufficient for the carrying on of navigation upon stream of these conditions?

The COURT. You mean for commercial purposes?

COUNSEL FOR COMPLAINANT. Yes, sir.

A. As low as three feet, I should think.

Q. You may state whether or not, upon a stream of these general conditions, the presence in the stream of different places at stretches of from a quarter of a mile to a mile where the water would be in low water as low as fifteen inches deep, for the period of a month or six weeks in each year, would deprive the stream of its character as a navigable stream.

Objected to as asking for a legal conclusion, navigable stream, rather than whether in fact it could be navigated for commercial purposes.

COUNSEL FOR COMPLAINANT. I will adopt what you say: That a stream having those conditions would be in fact navigated for commercial purposes.

A. Yes, sir, it could.

*Cross-Examination.*

440 I am sixty years old. I first began to navigate the Ohio river in about 1870, when about twenty-two years old. That is when I went on to learn the river. It took me three years to learn it. I got my license in 1873. After I obtained my license I was a pilot on a boat for a while until I knew how to man a boat. When I first took command of a

boat, I guess it was about five years after I was piloting. I think it was about that; before I took out a captain's license, about 1879 or 1880, along there, about that I guess; I don't recollect the year. I obtained command of my first boat about 1879 or 1880, on the Ohio river, between Syracuse, Ohio, and Louisville, Kentucky. I was first on one boat and then on another. I was not on one regular boat all the time. I had charge of a boat as long as four years at a time.

441 The first boat was a tow boat, towing coal and salt,—towing barges filled with coal,—what we would call a towboat. I would not call it a tug. She had about fifteen or eighteen-inch cylinder, fifteen-inch cylinder, and five and a half stroke, five and a half foot stroke; all towboats are stern-wheels. In the water when light she drew about thirty inches. I operated her about two and a half years, that is in one time, running time. I have been on, I expect, fifty different boats or more.

It has been thirty-five years since I got my license, about, and I have been working on the river most of the time until last December, I have not been on the river since December. All the boats that I have been captain of were towboats. I have piloted on passenger boats, but I have never had charge of one. As to acting as pilot on passenger boats, the longest at one time was about a year. Those boats operated between Charleston, Virginia, and Cincinnati, Ohio, on the Kanawha river, and the Ohio river together,—the Steamer Boone.

442 I was thirty-five years on the Ohio, and I guess about three years on the Kanawha river; that is, I was in the Ohio and Kanawha together on boats that run up the Kanawha river. My license went to the head of navigation on the Kanawha, Canaltion, about eighty miles from the mouth of the Kanawha. The character of the boats I had charge of running in the Kanawha river was mostly towboats. Brought up empty boats and brought out coal from the mines. The barges carried from ten to twelve thousand bushels, they would draw about six feet or six and a half, along about that. We always put our fuel on the steamboats, what we would use on the trip, and put them down to about three and a half or four feet, generally. It would depend on the class of boat it was. If it was a small boat it would not carry very much coal and it was not built as deep in the hold as the large ones.

The Ohio river I navigated as far up as Syracuse, Ohio, about twenty-five miles above the mouth of the Kanawha river. It is near Pomeroy, Ohio, about seven miles above 443 Pomeroy, or six miles. Below Pomeroy there were some shoals there, at Eight-mile Island, it is called. The extent of those shoals in the river, in length, were about a quarter of a mile, I suppose; the worse part of it, not over a quarter of a mile, I think.

I have taken towboats up with empty barges up over those shoals in low water. The barges, of course, were light and would not draw over six or eight inches; steamboats would draw thirty inches or more. The towboats drew some thirty inches; of course, smaller boats were lighter draught. I 444 have taken all kind up over those shoals on low water; taken barges partly loaded. They could go over the shoals without stopping. The water at that time was three or four feet deep, along there. I have taken small boats up. We carried passengers and freight on, when there was ten to twelve inches in the river, over those shoals; as low as ten inches I have taken on one particular boat. It very seldom got down to twelve inches, very seldom. The usual depth during the dry season was about twenty-six inches, or twenty-eight, along there. I can remember one season when it got as low as 15 inches. It was along in the '70s; I don't recollect the year at all. I have never seen it that low since. Sup- 445 pose it were only twelve to fifteen inches deep all the way from Pomeroy to Louisville, small boats could run there at that stage, and it would be possible, in my judgment, to carry on profitable commercial navigation; I know it has been profitable, anyway.

Being asked: "Did you ever know a time when the river was twelve to fifteen inches deep all the way from Pomeroy to Louisville, Kentucky," Captain Bing replied: "Not all the way; no, sir."

Captain Bing further testified that there is a place above Cincinnati,—there was before they improved the river there, that it got as low as the shoals at Pomeroy, a place called Nine-mile, and Eight-mile, and Four-mile; they are all strung along there together. I did navigate over those places before the river improvements. It was a sand bottom and we had a good deal of trouble there. As to the average depth of the water there during the dry season, I have seen it down

to twenty inches, and two feet; and along there, there is a stretch that is all shoal, bad places, of about five or six miles, from Four-mile to Eight or Nine-mile.

Being asked if a man had a small boat that only drew six inches of water, he could run it over those shoals, he replied: They did do it. There were lots of them around. Small boats that drew eight or ten inches."

The distance between Pomeroy and Cincinnati was two hundred and fifty miles, I believe it is estimated. I went up the river with tows that didn't make over a mile and a half an hour and I went up with some side tows, with a different stage of water that would make four and a half or five miles an hour. It would depend altogether upon the tow you had and the stage of the water. When our tow and barge were light, we would make five miles an hour; when the barge was loaded, the tow was loaded, we would not make more than from one to two miles an hour. We very seldom tow our loaded barges up the stream. If we do it is not very much.

I say we make as high as four and a half or five miles an hour with a medium sized tow of empty barges going up the river.

As to the kind of passenger boats operated by me for a time on the Ohio river,—they carried passengers and freight; stern wheelers, flat bottomed boats, somewhat similar to the boats used on the Mississippi river. They drew, well, from about three to four feet generally. Four and a half some of them; it depends upon the size of the boat. Those passenger boats operated from Cincinnati to Charleston, West Virginia,—the boat I was on. Charleston is on the Kanawha river, about the mouth of the Kanawha river,—sixty or eighty miles they call it. The size of those passenger boats was about 300 tons, what she carried. I would not be positive. Something like that. She drew very nearly thirty inches.

I have been on a good many others, just for a short time. There would be trips down there when I was only on a boat for three or four or five days, and then I would be on another one; what you would call tripping. I have been on a great many at low water season, but not steady, just for trips. They will make twelve or fourteen miles an hour down the stream with the current. It depends upon the stage of the river a good deal, too, that does. Sometimes they will make fifteen miles, if it is a big river maybe more. Going

up the river they will make six or seven, or eight miles an hour, some ten.

The steamer Boone I was on; she just averaged about eight miles an hour, we always considered she would make about eight miles an hour going up stream, from Cincinnati to 449 Charleston. That counted out the landings, too. We had to land our wharf boats and do business. Going up in the Kanawha, I never timed her. I suppose six or seven miles an hour; I would not be positive about that.

I have not navigated very much on the Kanawha river since the improvements, about twelve years ago. Locks and dams were put in,—one near the mouth, about a mile from the mouth, and then there were about eight or nine or ten miles apart, something like that. All the way up to just below Canaltion, I think there was eight locks, eight or ten, I would not be positive which. There were no canals put in since those improvements were commenced. I have been up the river since, but not to run there regularly. I have been as far as Charleston since, on boats, several times. Since Congress first began the improvement of the Kanawha river, I do not recollect how long it has been.

There were locks and dams in the river when I operated there, at the head of the river, what is called Paint Creek

Lock. That is below Canaltion and above Charleston 450 about ten miles, I think. The sluices spoken of in direct examination are a rock wall built up, right along where the deepest part of the water runs, the channel they call it. I don't think the Government put it in. I think some company that improved the Kanawha river in the start, did it. The Government afterwards put the locks and dams in there. That was there long before I ever was. That sluice I speak of is the one called Red House, about forty miles up from the mouth Kanawha, and about twenty miles below Charleston; I suppose about 150 feet wide, possibly, or 200. I took my towboats with barges up through there.

Captain Bing being asked: "I suppose when a person is going up through a current of that kind, the current always seems a little more swift than it really is, doesn't it, Captain?" replied, "Well, I don't know about that," and continued testifying as follows:

As to the difficulty in taking boats up through that sluice,—sometimes they would have to what you call double trip, take part of the barges at a time, possibly have so many she

would shove on through, take three or four and come back and get the rest and go through this place. We have done that often. Sometimes have to lay a line on the wall and run them up through a little nigger. That is something like the process known as cordelling; hitch a chain up ahead and pull the boat up. I had to do that at that sluice, only in that low water.

That sluice was two or three hundred yards long, I suppose, something like that. I don't know exactly the length of it, but I suppose it would be two or three hundred yards, something like that.

Being asked: "Did you ever measure the velocity of the current at that point?" replied in the negative, and to similar questions as to the Ohio, Kanawha and other rivers.

Captain Bing further testified:

I would think it would be eight or ten miles an hour, the current, but I don't know,—that would be my idea of it, gained from the fact that it is quite difficult to get up there with boats.

I did make five miles an hour up the Kanawha river with only one barge in tow. With the barge light, as to calculating or measuring the speed, we know the distance on the river, all of it, all pilots ought to know the distance and we always count when we are on watch. We know what the distance is from one point to another. That is the way that our speed, that is the way we get our speed of the boat, what time she is making. Say, I come on at twelve o'clock today, I can tell at supper time how far I have come. I know just how many miles I have made in an hour.

As to the Kanawha river, I never calculated that at all. I know they could do it; I am satisfied, make five miles an hour up the Kanawha river with one barge, from the mouth to Charleston. I am not guessing at it at all. I never took and measured it, of course. We know the distance and know how many hours we are going while on, and we will average that about so many miles, we consider it.

With a tow, I have averaged four miles an hour, and I have average seven miles an hour, and five miles an hour; it depends upon the size of the steamboat and the amount of barges we have in tow. You may take a boat, a large steamboat and put on twenty barges to her, she would not make over four miles an hour, while a small boat with three barges would make four miles an hour, or five miles an hour.



I said, with one barge, a towboat will make from five to six miles an hour, but take eight or ten or fifteen barges, she won't begin to make anything like that. Maybe three miles, or three and a half, something like that; depends upon the stage of the water. One of those tow boats going without any barges will make eight or ten miles an hour up-  
454 stream; some make more than that; some will make twelve. Lots of them that I have been on made that time; yes, sir. H. F. Frisbie was one towboat. She would make twelve or fourteen miles an hour up stream without any tow.

Well, an ordinary tow, I have made five miles an hour with her, with empty barges up stream. The Frisbie was owned at Cincinnati. She ran to St. Louis part of the time and ran to Pomeroy. Hedwig owned her. She went out of commission three or four years ago, maybe longer, I do not know just exactly the time. Mr. Hedwig lives in Kentucky near Cincinnati, near Dayton, Kentucky.

455 I don't know anything about the engineering at all. I have heard the expression used, slopes of a river, but I don't know anything about it. As to the fall of a stream, I don't know anything about it, it is out of my line.

As to whether a river could be navigated for the purposes of commerce that had a fall of 90 feet in a distance of 18 miles, I should not hardly think so.

If you assume that a portion of that river 18 miles in length is on a level, say there is a six-mile stretch of practically level water, or a very gentle slope, and that the remainder of this fall of 90 feet is in the balance of the river, that that stream could be used profitably for commercial purposes in navigation, there would have to be improvements made on it.

456 VALENTINE L. SCHLINK, a witness for complainant, testified as follows:

*Direct Examination.*

My name is Valentine L. Schlink. I will be 78 years old in August of this year. I live in Peoria. I have lived there since December, 1844. I know Mr. S. DeWitt Drown in Peoria. I knew him since sometime in the spring of 1845; every day I suppose, from there on to 1848. He was surveyor. He also wrote for the newspapers. He wrote for the

Gazette awhile, published several directories. I was clerking in the postoffice then. In those days they did not have free delivery. Men used to come to the postoffice for their mail. He came and got his mail there at the office. I used to wait on him at the postoffice. My acquaintance with him did not cease when I left the postoffice. I knew him until he  
457 died, or about the time he died. I think he died in the later part of 1857 or the forepart of 1858; I would not be positive about the date exactly.

(Book handed to witness.) I had a copy of this work myself at one time; I haven't got it now. That is one of the Drown directories and histories that I referred to. As to the reputation and standing of that book at the time when it was published and from that time forward, in the City of Peoria, for authenticity, accuracy and reliability,—it was good.

458 I am seventy-eight, born about 1830. In 1857 I would have been 27 years old. Mr. Drown was 25 years older than I. He would have been born in 1805.

*Cross-Examination.*

I have talked in regard to the work of Mr. Drown, author of this book, with nobody; as to whom I have heard speak of the work, Judge William H. Fessenden was one man. He was the man I lived with, and Mr. Hamlin and he talked the matter over, coming up the river here to sell grain, to deliver grain and take back lumber to finish the courthouse  
459 in Peoria. As to whom I heard talk about Mr. Drown's book, in Peoria, they would be so innumerable I could not tell you. I have heard Judge Alls, I have heard Mose Dusenberry speak of it. It was about a year ago since I heard anybody speak about it,—refer to his book, that he said so and so about the Illinois river. The occasion of that conversation in regard to Drown's book was about high water. Besides the persons named, I heard, well, I just cannot tell, but several people anyway speak of it. As to any occasion, any particular time, except the one mentioned, when I heard it spoken of by anybody, I would not be very sure now, but I know it is the general talk all over town. Everybody refers to Drown's book of history. If I stayed here half an hour I might think of a dozen that I cannot think of now. The particular one was the book of '44 that he wrote. As to ever hearing any question raised or anybody say that some

statements in Drown's book were not true and not correct, I did not; no, sir. I never heard that question raised at all.

Well, it was discussed at one time in court there when I was one of the witnesses when that levee business came in court about '44, but they took the guide to go by. That was not in the Sanitary District case. It was the Central National Bank against the City, or the City against the Central National Bank; I forget which it was, one of them. I never testified in any of the Sanitary District cases.

*Re-direct Examination.*

This was a book which was in general circulation in Peoria in the '50s. I have owned one of them, and I guess a great many others have owned them.

I know this man, Mr. Woodcock, the printer. He lived in the premises I used to own; Mr. E. O. Woodcock, the old gentleman; I knew him in the printing and publishing business. From my acquaintance with Mr. Drown and Mr. Woodcock, I could say that this book was published by Woodcock.

461

*Re-cross Examination*

I know it was published by Mr. Woodcock, because it says so in the back; yes, sir; and everybody else says so there. "Did you get one of those books that Drown published?" That question was asked a good many times, I think.

And thereupon counsel for complainant read the title page of the book, "Drown's Record and Historical View of Peoria, from the Discovery by the French Jesuit Missionaries, in the Seventeenth Century, to the present time. Also, an Almanac for 1851, calculated for the latitude and longitude of Peoria, Illinois, 40 degrees, 40 minutes north, longitude 89 degrees 40 minutes west from the Royal Observatory at Greenwich; and 12 degrees 40 minutes west from the City of Washington. To which is added Business Directory of the City, with Business Cards by S. DeWitt Drown." Then it is signed with the national coat of arms. "Peoria, Ill. Printed by E. O. Woodcock, Main Street, 1850."

Thereupon complainant put the preface in evidence, said preface being as follows:

"In presenting this number, my second attempt of a

'Peoria Directory,' or Record of Events, &c., I will not disguise the gratification it affords me to observe the flattering manner in which my first was received by the public, and the approval of the work (together with my subsequent annual sheet) by distinguished men in our city and elsewhere as it found its way abroad. The improvements and additions which have been introduced in this will, it is hoped, meet with general approbation and insure its continuance of public favor; they will be readily seen by a glance at its contents.

At this time, when the all-engrossing theme of public and private speculation is 'California Gold' and the *dimes*, it may be hazardous in me to introduce this undertaking of a book, to vie with the periodicals of the day, or any of the 'Offerings' with their gold edges or gilded bindings, with the expectation of arresting attention in outward appearance, for as the poet has sung—

Dimes and dollars, dollars and dimes,  
Poverty is the worst of crimes.

I stand convicted for the want of *dimes* to make it externally glittering, but 'all is not gold that glitters,' neither are *all the books* bound in gilt worth much more than their binding. I have, however, spared no pains in endeavoring to procure for insertion in my Record, all the information which ought to have a place in a work  
462 of this kind; but it is not so full as I am desirous to have it; such omissions are to be attributed to no lack of energy on my part, but rather to the impossibility of obtaining the desired information.

I have expended some time, all must acknowledge; and the inquiry naturally arises, and I have often been asked, 'where do you get those facts?' I cannot give you the details, but it is enough that you have them, so that they may be transmitted to posterity. If the past thirty years, under so many disadvantages, has witnessed the developments now before us, what will the next generation bring forth? If we bear in mind the basis on which the past growth has taken place, reflect on the starting point thirty-one years since, compared with the vantage ground which *we now occupy*, can any imagination in its boldest flight exceed the reality? Will not facts in the future, as in the past, outstrip fancy? For who among our 'oldest inhabitants' fifteen or twenty years

ago would have dared to predict what we now realize in Peoria? They have become the wonders of history. Could those who first came to Peoria and took up their abode on the banks of our beautiful lake, could they ever have dreamed of a future so glorious for this country and vicinity as that future has since proved? Nor can we, with all the advantages we now enjoy, of commerce and telegraphic improvements, measure the greatness we may attain by the Oquawka Railroad, plank roads and other improvements in contemplation. Who can tell what we may attain in the next thirty years of Peoria history? Conjecture is staggered at the project, and dares not attempt an estimate.

In collecting these cursory 'Scraps of History,' I have ventured to present the details of some mining operations in a field but little noticed until recently, (like the gold mines of California), but which with a reasonable amount of patient toil, may be made to yield abundantly. A few there are, however, who yet remain as links between the past and present,—links which are snapping year by year and month by month, and with them are vanishing the *historic circumstances of by-gone days and years*, when the prairies and bluffs of the Illinois in and about Peoria were inhabited by the Red Man and on the margin of our beautiful lake, here and there, 'solitary and alone' stood the log hamlet of the pioneers in the 'far West.'

My principal aim in this production is the preservation of the memorials of some of our city's history, institutions, &c. I have, since the publication of my directory in 1844, annually kept up a synopsis of our improvements by a small sheet under the title of *Peoria Annual Record, or Drown's Statistics*. I have now attempted a much more useful periodical in a different form for the convenience of the public and intend to continue the publication of similar researches from time to time, annually with an *Almanac for each year* with a hope also of enlisting others to collect facts and details concerning such institutions as remain to be noticed not only in our city and county, but such as will be of use to the citizens of our State. The co-operation of any one who may take an interest in matters of this character is solicited in collecting whatever may tend to throw light upon the

past as well as to observe authentic memorials of the present connected with the Ancient or Modern History of Peoria, that shall in any way tend to illuminate the path and enlighten the labors of the future historian, will be duly appreciated. These are the main objects of this work, although other departments have been embodied so as to be in keeping with its title and the wants of the public.

463 I have attempted the publication of this RECORD AND HISTORY from a decided conviction that such a work will be useful to the people of the city, county and State; and should be encouraged, I intend hereafter to make it a Book of References, communicating much valuable information to men of business and 'the rest of mankind.' The utility of such a book must be manifest to all, as has been abundantly tested in other states. Of its merits and its claims to patronage, the public must judge. Unwearied efforts and untiring labor have been exerted to make it what it is; and *what it is*, with all its imperfections, is stamped upon its face. That it is *entirely free from errors* is not expected; but it is believed to be as correct as, in the nature of things, it is possible, in the first instance, to make such a book out of an unorganized mass of materials, collected from every quarter, oral and written. Undoubtedly many omissions will be observed of matters necessary to give completeness to the work. I shall be glad to receive from those who may notice errors or omissions, the sum of their knowledge for future use, there being wisdom, generally in a 'multitude of counsellors.'

I am indebted to many of the public officers of our city, as well as the 'oldest inhabitants' for many favors and much valuable information. I deem it a gratifying duty from me to the business portions of Peoria, to say a word with respect to the reception which they gave my former efforts to serve them in this way; but from the *reasonable, charitable portion of the public*, I have received every allowance for not having performed merely a stupendous difficulty but even an utter impossibility. Of the insuperable difficulty of getting up such a work, many are aware; though still a greater number are not, neither can they be without trial.

With these remarks, and with the hope that this little

Manuel will receive sufficient patronage to remunerate me for the great labor and expense which has attended its publication, and induce its continuance hereafter, it is now submitted to the *decision of the public*, very respectfully by the publisher.

S. DEWITT DROWN.

Peoria, December, 1850."

COUNSEL FOR DEFENDANT. We object to reading anything from it in evidence until we have had an opportunity to see the book and see what ought to go in as explanatory to anything Mr. Starr wants to put in. That is the same question we had up this morning. We don't want him to pick out an isolated sentence and put in evidence.

COUNSEL FOR COMPLAINANT. I respectfully submit we have a right under the proof made of the pertinence or admissibility of books to offer such parts of it as we please, and if counsel shows to the court that there are other parts explanatory that should go in, all right.

THE COURT. I will let it go in that way.

Counsel for complainant thereupon introduced and read in evidence the following from pages 83 and 84 of said book:

464 "Another of our old pioneers and citizens, who is still with us, Mr. John Hamlin, of Mass. He came here in the spring of 1821, from Springfield, in company with John Lockwood, Judge Latham (who afterwards became a citizen and proprietor of city lots, and died here in 1826, and whom I shall have occasion hereafter to notice), Maj. Iles, Gen. J. Adams, and a Mr. Winchester, Maj. Graham, Indian agent, of St. Louis, came here about that time with a keel-boat and proceeded up to LaSalle prairie (Rome) where he paid off the Indians their annuity. Some of them returned and settled here subsequently, and became useful citizens in building up our city. In 1832, an Indian agency was opened and established here by the Government, of which Judge Latham was appointed agent, in place of Maj. Graham, of St. Louis, where it had heretofore been kept. John Hamlin, Esq., was a clerk, in and kept a branch of the American Fur Company's store in this place, in one of the buildings in the center of the view between Water street and the Lake—the building from the right, just below the Inn sign-post. In this store were kept Indian commodities chiefly. A portion, however, was adapted to the wants



of the citizens, who, at this time were few. Mr. Hamlin while thus engaged in this store, exported the first produce to Chicago in 1825, in keel-boats as far as the mouth of the Kankakee River, and from there in Durham boats to Chicago, (having built a storehouse at the former place to store in from the keel-boats, to be taken by the Durham boats up the Aux Plain River.

The principal articles exported were pork, beans, and other provisions for the use of the Fur Company. There were but a very few families till within a few years of this time, within the present bounds of the city, till about 1832.—”

*Complainant's Evidence.*

of the Illinois River in Sect

No. 36 T No. 34 R No 8 E

S 26 E 3 00

S 20 E 1 15

S 10 E 6 00

S 29 E 1 15 Struck the post

---

136.65 On the Range line

Land timbered Bottom good soil.

Aug. 17th (P. 265)

Meandered down the E bank of the Kankakee in

Sect. No. 25 T No. 34 N R No 8 E

N 21 E 3 00

N 26½ E 10 00) Mouth of the Illinois

S 84 E 5 00) and continued up

) the S Bank of the same

S 63 E 10 50)

S 57 E 5 00

S 50 E 5 50 Struck the post

---

39.00 corner of F Sects No 25 & 36

Land prairie with some

scattering oak thorn &c

2nd rate soil

(P. 266)

Meandered up the S bank of

the Illinois in Sect No 36 T No 34

N R No. 8 E

S 35 E 1 00

S 9 E 12 00

S 40 E 5 50

S 30 E 5 00

S 29 E .86 Struck the post

---

24.36 on the Range line

between Ranges No 8 & 9

Land same as last

Aug 19th

(Vol. 245, P. 163)

Commenced meandering on the

S E Bank of the Illinois river at the

corner of fractl Townships 34 & 34 N

466a

of Rs. 8 & 9E, thence up the river with  
the meanders thereof.

C. L.

466b thence S 38 E 03.00  
S 42 E 19 08  
S 52 E 08 10  
S 65 E 16 26  
N 55 E 13 00  
N 41 E 04 00  
N 43 E 02 59  
N 53 E 19 00  
N 33 E 15 79  
N 11 E 09 34

---

110 16

Intersected the corner of fract  
Sect 31 & 32 T 34 N of R 9 E

(P. 164)

Thence from the corner of  
fractional Section 31 & 32 T 34 N  
of R 9 E

C. L.

N 19 E 04 49

Intersected the corner of fractl  
Sect 29 & 32 T 34 N of R 9 E  
thence from said corner

C. L.

thence N 01 E 05 31  
N 36 E 03 00  
N 49 E 09 48  
N 63 E 02 62  
N 36 E 17 43  
N 48 E 04 75  
N 40 E 11 44  
N 51 E 18 83  
N 39 E 19 00  
N 17 E 09 29  
N 28-35M.E 03 81

---

109 45

466c Intersected the corner of fract Sect 20 & 29  
The mouth of a creek fills the space between  
the corner of fractl sect 31 & 32—29 — 30

(165)

Thence from the corner of fractl sect  
20 & 29 T 34 N of R 9 E

C. L.

N 16 E 14 50

N 25 E 21 80

N 28 E 05 60

Intesected the corner of fractl  
sect 20 & 21

Thence from the corner of fract  
Sect 20 & 21 T 30 N of R 9 E

C. L.

N 15 E 08 28

N 40 E 05 26

N 57 E 08 30

N 68 E 17 26

N 77 E 11 44

N 62 E 28 23

N 87 E 20 39

N 55 E 04 06

135 12

Intersected the corner of  
fractl sect 21 & 22 at the station of  
N 77 E is a good spring of water

(P. 166)

Thence from the corner of fract  
sects 21 & 22 T 34 N of R 9 E.

466d

C. L.

N 51 E 03 79

Intersected the corner of fract  
sect 15 & 22

Thence from the corner of fractl  
sect 15 & 22 T 34 N of R 9 E

C. L.

N 50 E 15 50

N 27 E 09 00

N 40 E 02 50

N 50 E 10 15

N 42 E 04 50

N 48 E 02 50

N 54 E 27 39

N 37 E 06 50

N 48 E 13 92

N 55 E	06 00
N 76 E	04 73

---

106 48

Intersected the corner of fract'l  
sect 14 & 15

20th September 1821

(P. 167)

Thence from the corner of fractl  
sect 14 & 15 T 34 N of R 9 E

C. L.

S 82 E	09 31
N 65 E	11 18
N 54 E	13 25
N 51 E	02 65

---

36 39

Intersected the corner of fract  
sect 11 & 14 T 34 N of R 9 E.

(P. 168)

466e

thence from the corner of  
fractl sect 11 & 14 T 34

N of R 9 E C. L.

N 38 E	26 32
N 09 E	06 44
N 01 W	17 18
N 52 W	06-59
N 42 W	04 14
N 11 W	07 36
N 17 E	07 00
N 32 E	06 18
N 20 E	05 37

at 370 L on the last course  
is the mouth of a brook 20 L wide

N 04 E 02 55

M.

N 04°30 W 02 12

---

91 25

Intersected the corner of fractl  
sect 2 & 11 T 34 N of R 9 E

(P. 169)

thence from the corner of fract'l  
sect 2 & 11 T 34 N of R 9 E

	C. L.
N 03 E	10 00
N 10 W	41 71
N 06 W	09 19
N 05 E	10 27
N 19 E	04 76
N 47°35M E08	51

---

84 44

Intersected the corner of fractl  
townships 35 & 34 N of R 9 E  
5th November 1821.

466f Commenced meandering on the  
S. E. Bank of the Illinois river  
at the corner of fractl Townships  
34 & 35 N of R 9 E thence up the  
River with the meanders thereof.

	C. L.
N 44 E	06 00
N 37 E	08 90
N 56 E	05 43
N 64 E	14 00
N 66 E	05 56

---

39 89

Intersected the corner of fractl  
Sect 35 & 36 T 35 N of R 9 E  
(P. 171.)

thence from the corner of fractl  
Sect 35 & 36 T 35 N. of R 9 E

	C. L.
N 73 E	07 41
N 69 E	15 83
N 61 E	08 69
N 58 E	11 92
N 51 E	15 35
N 47 E	08 00
N 52 E	09 83
N 56 E	12 95
N 40 E	06 59

---

96 57

Intersected the corner of

fractl townships 35 & 35 N of  
Rs. 9 & 19 E

6th November 1821

(p. 198)

466g

Commenced meandering on the  
N bank of the Illinois river at  
the corner of fractl Ts-34 & 34 N of Rs  
8 & 9 E thence up the River with the  
meanders thereof

	C. L.
S 34 E	05 24
S 39 E	05 55
S 47 E	07 16
S 58 E	20 50
S 66 E	03 90
S 89 E	05 38
N 59 E	17 79
N 38 E	08 63
N 31 E	07 61
N 20 E	06 50
N 16 E	06 00
N 09 E	02 64

---

96 90

Intersected the corner of  
fractl sect 30 & 31 T 34  
N of R 9 E

(P. 199)

thence from the corner of  
fractl sect 30 & 31 T 34  
N of R 9 E

	C. L.
N 28 E	09 10
N 35 E	04 37

Intersected the corner of fractl  
sect 29 & 30 T 34 N of R 9 E  
Thence from the corner of fractl  
sect 29 & 30 T 34 N of R 9 E.

466h

	C. L.
N 43 E	31 00
N 48 E	11 86
N 45 E	13 00
N 49 E	08 69



N 39 E	14 65
N 28 E	04 08
N 22 E	07 32

---

 104 07

Intersected the corner of  
fractl sect 20 & 29 T 34  
N of R 9 E

(P. 200)

thence from the corner  
of fractl sect 20 & 29 T  
34 N of R 9 E

C. L.

N 16 E	31 71
N 21 E	12 81
N 26 E	08 64
N 34 E	07 50

Intersected the corner of fractl  
sect 20 & 21 T 34 N of R 9 E  
thence from the corner of fract  
sect 20 & 21 T 34 N of R 9 E

C. L.

N 42 E	03 50
N 65 E	16 33
N 80 E	18 00

at 950 L on this course is the mouth  
of lapage creek 200 L wide

N 75 E	08 92
N 63 E	12 25
N 72 E	10 11

---

 129 77

466i Intersected the corner of fract  
sect 16 & 21 T 34 N of R 9 E

(P. 201)

Thence from the corner of fractl  
sect 16 & 21 T 34 N of R 9 E

C. L.

N 50 E	07 11
N 56 E	12 42

Intersected the corner of fractl  
sect 15 & 16 T 34 N of R 9 E

	C. L.
N 54 E	16 07
N 65 E	06 39
N 50 E	05 56
N 53 E	14 80
N 48 E	27 87
N 50 E	15 50
N 66 E	10 66

M.

N 59° 15 E 04 20

---

120 58

Intersected the corner of fractl  
sect 14 & 15 T 34 N R 9 E

(P. 202)

thence from the corner of fractl  
sect 14 & 15 T 34 N of R 9 E

C. L.

N 47 E	06 38
N 36 E	04 11

Intersected the corner of fractl  
sect 11 & 14 T 34 N of R 9 E

Thence from the corner of fractl  
sect 11 & 14 T 34 N of R 9 E

466j

C. C.

N 32 E	09 36
N 24 E	16 92
N 06 E	06 52
N 68 E	06 71
N 46 E	06 45
N 16 E	04 00
N 05 E	07 75
N 07 W	08 50
N 05 E	07 80
N 16 E	12 57
N 32 E	03 94

M

N 14° 30 E 02 27

---

101 28

Intersected the corner of fractl  
sect 2 & 11 T 34 N of R 9 E

(P. 203)

thence from the corner of fractl  
sect 2 & 11 T 34 N of R 9 E

C. L.

N 02 E	04 18
N 08 W	24 62
N 13 W	06 28
N 32 W	04 41
N 19 W	27 21
N 11 E	16 04

Intersected the corner of fractl  
Townships 34 & 35 N of R 9 E

(P. 204)

Commenced meandering on the N W bank  
of the Illinois river at the corner of  
fractl townships 34 & 35 N of R 9 E thence  
up the River with the meanders thereof.

466k

C. L.

N 52 E	04 68
N 04 E	09 58
N 60 E	11 70
N 48 E	14 95
N 59 E	26 44
N 66 E	02 93
N 56 E	03 96

---

 74 24

Intersected the corner of fractl  
sect 35 & 36 T 35 of R 9 E

(P. 205)

thence from the corner of fractl  
sect 35 & 36 T 35 N of R 9 E

C. L.

N 50 E	04 14
N 72 E	07 50
N 81 E	11 20
N 50 E	08 80
N 47 E	12 50
N 54 E	04 90
N 88 E	08 00
N 62 E	18 00
N 83 E	04 72

---

 79 76

Intersected the corner of fractl  
sect 25 & 36 T 35 N of R 9 E

(P. 206)

thence from the corner of fractl  
sect 25 & 36 T 35 N of R 9 E

C. L.

N 38 E 06 10

N 49 E 08 22

---

14 32

Intersected the corner of fractl  
townships 35 & 35 N of Rs 9 & 10 E.

(P. 207)

4661 Commeneed meandering on the West bank  
of the Island in Illinois river at the  
corner of fractl sect 11 & 14 T 34 N of  
R 9 E thence down the river with the  
meanders thereof

C. L.

S 34 W 05 50

S 45 W 07 27

thence up the River

N 78 E 08 76

N 68 E 02 78

N 58 E 10 28

N 71 E 04 03

---

38 62

Intersected the corner on the E of  
the Island

(P. 210)

thence from the corner of fract  
sect 11 & 14 T 34 N of R 9 E on the  
E of the Island

C. L.

N 50 E 08 00

N 36 E 09 89

N 26 E 03 50

N 60 E 03 76

N 29 E 06 23

N 00 05 31

N 15 W 12 60

W 00 04 26

S 28 W 05 90

466m

S 26 W	07 50
S 67 W	08 79
S 48 W	02 30
S 22 W	05 50
S 27 W	13 00
S 25 W	06 00
M.	
S 29° 30 W	02 45

---

104 99

Intersected the beginning corner  
on the W of the Island

14th November 1821

(P. 142)

Commenced meandering on the S. E. bank of  
the Illinois River at the corner of fract  
Townships No. 35 & 35 N of the Base line  
of Rs. 9 & 10 of the 3rd Principal  
meridian thence up the river with the  
meanders thereof

C. L.

N 55 E	02 30
N 62 E	02 16
N 42 E	02 00

---

6 46

Intersected the corner of fract  
sect 30 & 31 T 35 N of R 10 E

(P. 143)

thence from the corner of fract  
sect 30 & 31 T 35 N of R 10 E

C. L.

466n

N 60 E	04 14
N 53 E	05 50
N 58 E	09 69
N 46 E	04 30
N 33 E	03 74
N 44 E	04 91
N 50 E	11 00
N 64 E	17 91
N 35 E	04 20
N 11 E	06 39
N 35 E	03 00
N 55 E	11 00

N 50 E 13 00

N 41 E 07 11

M.

N 28-30 E 01 86

---

107 55

Intersected the corner of fract sect  
29 & 30 T 35 N of R 10 E.

16th August 1821

(P. 144)

thence from the corner of fract  
sect 29 & 30 T 35 N of R 10 E

C. L.

N 11 E 07 71

N 37 E 03 84

N 55 E 03 02

---

14 57

Intersected the corner of fractl  
sect 20 & 29 T 35 N of R 10 E

(P. 145)

thence from the corner of fract sect  
20 & 29 T 35 N of R 10 E

C. L.

N 65 E 03 26

N 86 E 05 29

at 150 L on the last course is the mouth of a  
brook 3 L wide

N 75 E 05 88

at 525 L on the last course is the mouth  
of brook 5 L wide

466o

N 89 E 01 62

S 84 E 03 63

N 69 E 02 44

N 51 E 02 91

N 80 E 02 60

N 50 E 09 86

N 45 E 09 00

N 04 79

N 53 E 03 14

S 85 E 03 88

S 45 E 04 39

N 88 E 05 50

---

68 19

(P. 146)

C. L.

thence	N	60	E	09	35
	S	68	E	04	50
	N	87	E	06	86

---

 20 71

Intersected the corner of fractl  
sect 20 & 21 T 35 N of 10 E

(P. 147)

thence from the corner of fractl sect  
20 & 21 T 35 N of R 10 E

N	15	E	09	63
N	37	E	12	50
N	35	E	03	12
N	22	E	01	68
N	30	E	09	50
N	43	E	04	50
N	32	E	09	00

at 425 L on this course is the mouth of  
a creek 100 L wide

N	65	E	01	45
N	87	E	05	11
N	35	E	04	57
N	14	E	04	90
N	04	W	01	75

466p

---

 67 71

Intersected the course of fractl  
sect 16 & 21 T 35 N of R 10 E

17th August 1821

(P. 148)

thence from the corner of fractl  
sect 16 & 21 T 35 N of R 10 E

C. L.

N	15	E	06	00
N	38	E	03	82
N	65	E	02	41
N	50	E	02	12
N	80	E	04	14
N	41	E	02	59
N	27	E	03	13
N	10	E	03	82
N	34	E	03	30



N 15 E	20 78
N 04 W	11 00
N 13 E	14 15
N 38 E	06 15
N 22 E	04 38

---

87 79

Intersected the corner of fractl  
sect 9 & 16 T 35 N of R 10 E  
(P. 149)

thence from the corner of fractl  
sect 9 & 16 T 35 N of R 10 E.

C. L.

466q

N 07 E	07 22
N 19 W	07 00
N 05 E	12 22
N 15 E	06 42
N 38 E	10 64
N 10 E	19 80
N 37 E	06 50

M

N 20° 15 E 07 32

intersected the corner of fractl sect  
9 & 10 T 35 N of R 10 E thence from  
the corner of fractl sect 9 & 10  
T 35 N of R 10 E.

N 18 45 E 07 98

---

85 10

Intersected the corner of fractl sect  
3 & 10 T 35 N of R 10 E  
(P. 150)

thence from the corner of fractl sect 3 & 10

C. L.

N 20 E	03 27
N 28 E	22 00
N 38 E	20 40
N 06 W	17 22
N 07 E	05 00
N 09 W	18 33

---

86 22

Intersected the corner of fractl  
townships 35 & 36 N of R 10 E  
18th August 1821

(P. 151)

Commenced meandering on the N W bank  
of the Illinois River at the corner of fractl  
townships 35 & 35 N of Rs 9 & 10 E thence up  
the river with the meanders thereof

466r	C. L.	
	N 46 E	14 00
	N 36 E	10 73
	N 48 E	07 36
	N 66 E	13 32
	N 43 E	13 79
	N 31 E	06 00
	N 45 E	09 00
	N 56 E	16 50
	N 40 E	06 71
	N 16 E	05 49

---

102 90

Intersected the corner of fractl  
sect 19 & 30 T 35 N of R 10 E

(P. 152)

thence from the corner of fractl sect 19 & 30  
T 35 N of R 10 E

C. L.	
N	03 25
N 50 E	14 41
M	
N 49.10 E	03 34

---

21 00

Intersected the corner of fractl sect  
19 & 20 T 35 N of R 10 E

(P. 153)

thence from the corner of fract sect 19  
& 20 T 35 N of R 10 E

N 66 E	22 50
N 75 E	09 50
N 86 E	05 95
N 52 E	02 56
N 34 E	10 68
N 81 E	09 13
S 73 E	21 83
M	
N 30-30E	11 39

---

93 54

466s

Intersected the corner of fractl  
sect 20 & 21 T 35 N of R 10 E

(P. 154)

thence from the corner of fractl sect 20 & 21.

C. L.

N 30 E 03 26

N 44 E 08 60

N 03 E 10 00

N 07 W 07 00

N 57 E 04 50

N 50 E 07 61

M

N 46°50 E 06 53

---

47 50

Intersected the corner of fractl  
Sect. 16 & 21 T 35 N of R 10 E at  
the head of the station of N 57 E  
is the lower point of several small  
islands.

19th August 1821

(P. 155)

thence from the corner of fractl sect 16 & 21

C. L.

N 27 E 11 00

N 42 E 12 44

here is the head of the Islands

N 31 E 22 00

N 19 E 11 50

N 04 E 16 80

N 22 E 12 74

M

N 30°30 E 03 43

---

89 91

Intersected the corner of fractl sect  
9 & 16 T 35 N of R 10 E here is the  
lower point of a small island 3 ch. in length

(P. 156)

thence from the corner of fractl  
sect 9 & 16.

C. L.

N 06 W 07 50

N 07 E 15 70

466t

N 15 E	11 71
N 33 E	12 46
N 01 E	13 83
N 16 E	16 94

M

N 38.50 E	06 83
-----------	-------

---

 84 97

Intersected the corner of fractl  
sect 4 & 9 T 35 N of R 10 E at  
1025 L on the course of N 15 E is  
a spring branch 1 L wide.

Ch.

On the course of N 16 E at 15.74 L  
is a brook formed by a spring 1 L wide

(P. 157)

Thence from the corner of fractl  
sect 4 & 9.

C. L.

N 16 E	04 76
N 24 E	03 57

---

 8 33

Intersected the corner of fractl  
sect 3 & 4 T 35 N of R 10 E at 3 Ch  
on the course of N 16 E is the head of  
an island 10 Ch in length

(P. 158)

thence from the corner of fractl sect 3 & 4

C. L.

N 18 E	12 61
--------	-------

opposite this is an island 15 chains in length

N 03 E	26 36
--------	-------

N 03 W	13 93
--------	-------

here is the head of a slew which partly encircles  
a small grove of timber and willow swamp

466u

N 39 E	21 00
--------	-------

M

N 00 50 W	04 73
-----------	-------

---

 77 63

Intersected the corner of fractl  
townships 35 & 36 N of R 10 E  
20th August 1821

(P. 175)

Commenced meandering on the W bank of the Illinois River at the Township corner of fractl Ts 35 & 36 N of R 10 E thence up the River with the meanders thereof.

	C. L.	
N 03 W	18	50
opposite this is a small Island		
N 29 W	11	50
N 40 W	09	59
N 25 W	08	50
N 08 W	07	00
N 02 E	09	00
N 06 E	14	22
M		
N 23-35 E	06	58

---

84 89

Intersected the corner of fractl sect 27 & 34 in the 4 last courses we have passed several small islands the principal channel at these Islands is on the W.

(P. 176)

thence from the corner of fractl sect 27 & 34 T 36 N of R 10 E

	C. L.	
N 20 E	16	50
on this course we passed a small Island		
N 15 E	07	50
On this course we passed a small Island.		

466v

	N 24 E	04	28
The channel	N 11 E	07	00
at the above			
named Islands	N 27 E	24	00
is on the W.			
	N 35 E	31	00
	M		
	N 41-25-E	06	57

---

96 85

Intersected the corner of fractl sect 22 & 27 here is the lower end of an Island the principal channel on the E. thence from the corner

of fractl sect 22 & 27 T 36 N of  
R 10 E

	C. L.
N 38° E	11 50
N 56 E	21 50
N 37 E	11 82
N 16 E	09 86
N 24 W	16 39
N 44 W	17 24
N 20 W	10 35
N 21 W	03 46

---

102 12

intersected the corner of fractl sect 15 & 22  
there are several small Islands between these  
courses with the principal channel on the W  
except the lowest down

(P. 178)

thence from the corner of fractl sect 15 & 22  
T 36 N of R 10 E.

	C. L.
N 28 W	13 68
N 01 W	11 64
N 24 E	23 44

466w in the above courses we passed 3 Islands  
channel on the W.

N 01 E	13 92
N 18 W	11 24
N 04 W	10 33

---

84 25

Intersected the corner of fractl sect 10 & 15  
in the last courses we have passed 5 small islands.

(P. 179)

thence from the corner of fractl sect 10 & 15  
T 36 N of R 10 E.

	C. L.
N 19 W	17 68
N 10 W	07 73
N 22 E	30 00
N	09 34
N 10 E	08 00

since leaving the corner we have passed sundry  
island channel on the W

N 03 E      10 90

---

83 65

intersected the corner of fractl sect 3 & 10  
T 36 N of R 10 E in the last course we passed  
a small island

(P. 180)

thence from the corner of fractl sect 3 & 10

T 36 N of R 10 E

C. L.

thence	N 03 E	25 00
	N 14 W	09 69
	N 02 E	16 68
x	N 23 W	06 90
	N 41 W	07 00
	N 06 W	10 77
	N 10 E	04 38

---

80 42

466x

intersected the corner of fractl  
townships 36 & 37 N of R 10 E a few chains  
below this intersection is the lower part of  
a small Island.

30th September 1821

(P. 181)

Commenced meandering on the E bank of the  
Illinois River at the corner of fractl. townships  
36 & 35 N of 10 E thence up the River with the  
meanders thereof.

C. L.

N	09 91
N 14 E	10 70
N 17 W	06 00
N 68 W	08 93
N 24 W	08 68
N 11 W	10 34
N 02 W	14 50
N 20 E	08 40
N 07 W	07 70
N 29 W	02 71
N 55 W	01 67

---

89 54

intersected the corner of fractl sect 27 & 34



(P. 182)

thence from the corner of fractl sect 27 & 34  
T 36 N of R 10 E with the meanders of the River

C. L.

N 34 E	06 89
N 43 E	06 34
N 26 E	09 34
N 07 E	12 50
N 17 E	11 20
N 30 E	34 00
N 57 E	04 29
N 70 E	12 50
N 37 E	03 91

466y

---

 100 97

Intersected the corner of fractl sect  
22 & 27 on the E bank of the River thence  
from the corner of fractl sect 22 & 27  
T 36 N of R 10 E. with the meanders of the river.

C. L.

N 63 E	05 00
N 73 E	04 21
N 40 E	13 30
N 47 E	04 47

---

 26 98

Intersected the corner of fract sect 22 & 23

(P. 184)

thence from the corner of fractl sect  
22 & 23 T 36 N of R 10 E with the meanders of  
the River

C. L.

N 49 E	03 74
N 29 E	14 58
N 03 E	11 71
N 21 W	05 78
N 37 W	05 73
N 66 W	03 86
N 49 W	02 69

---

 48 09

Intersected the corner of fractl sect 22 & 23  
we cross a creek 75 L wide in the last course,  
runs S

(P. 185)

thence from the corner of fractl sect 22 & 23 T  
36 N of R 10 E with the meanders of the River.

C. L.

466z

N 40 W	23 83
N 13 W	09 21
N 46 W	02 64

---

35 68

intersected the corner of fractl sect 15 & 22

(P. 186)

thence from the corner of fractl sect 15 & 22  
T 36 N of R 10 E.

C. L.

N 02 E	12 33
N 22 W	05 64
N 22 E	08 00
N 32 E	08 81
N 16 E	16 35
N 03 E	14 50
N 10 E	06 74
N 36 W	06 50
N 28 W	05 50
N 39 W	01 41

---

85 78

intersected the corner of fractl sect 10 & 15

(P. 187)

thence from the corner of fractl sect. 10 & 15  
T 36 N of R 10 E

C. L.

N 01 W	05 00
N 10 E	07 06
N 19 W	13 38
N 03 E	10 00
N 21 E	23 00
N 10 W	11 73
N 02 W	07 00
N 03 W	05 43

---

82 60

467

intersected the corner of fractl sect 3 & 10  
on the E bank of the Illinois River

(P. 188)

thence from the corner of fractl sect 3 & 10  
T 36 N of R 10 E with the meanders of the River

C. L.

N 13 E	21 50
N 08 W	15 76
N	12 83
N 15 W	14 00
N 31 W	05 00
N 69 W	97 10
N 31 W	03 43
N 14 E	04 28

M

N 15°, 30 E. 03 89

---

 87 79

intersected the corner or fractl Townships  
36 & 37 N of R 10 E.

October 2nd 1821

(P. 189)

Commenced meandering on the E bank of the  
Illinois river at the corner of fractl Townships  
36 & 37 N of R 10 E thence up the River with the  
meanders thereof

C. L.

N 44 E	02 72
N 21 E	09 22
N 34 E	10 40
N 11 E	04 72
N 57 E	02 30
N 66 E	06 62

---

 35 98

intersected the corner of fractl 34 & 35  
T 37 N of R 10 E.

(P. 190)

467a thence from the corner of fractl sect  
34 & 35 T 37 N of R 10 E

C. L.

N 61 E 29 00

at 250 L on this course is the head of a  
slew 300 L wide

N 40 E	20 39
N 29 E	26 13

---

75 52

intersected the corner of fractl 26 & 35

T 37 N of R 10 E

(P. 191)

thence from the corner of fractl sect 26 & 35

T 37 N of R 10 E with the meanders of the River.

C. L.

N 33 E	34 40
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N 47 E	07 00
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M

N 43°30 E	08 70
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50 10

Intersected the corner of fractl sect 25 & 26

T 37 N of R 10 E

9th October 1821

(P. 192)

thence from the corner of fractl sect 25 & 26

T 37 N of R 10 E with the meanders of the River.

C. L.

N 76 E	05 50
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N 85 E	04 58
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N 72 E	06 20
--------	-------

N 64 E	06 23
--------	-------

N 72 E	05 50
--------	-------

N 83 E	21 57
--------	-------

N 76 E	07 88
--------	-------

N 51 E	03 90
--------	-------

N 41 E	14 00
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N 24 E	07 29
--------	-------

N 40 E	05 68
--------	-------

N 51 E	07 60
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95 93

intersected the corner of fractl townships

37 N of Rs 10 & 11 E on the S E bank of the River.

(P. 193)

Commenced meandering on the N. W. bank of the Illinois River at the corner of fractl Townships 36 & 37 N of R 10 E thence up the River with the meanders thereof.

	C. L.
N 12 E	07 60
N 24 E	06 92
N 37 E	11 12
N 46 E	13 00

at 150 L on the last course is a  
spring branch 5 L wide, S at this place  
is the lower point of a lake which the River  
passes through

N 28 E	10 16
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48 80

intersected the corner of fractl sect  
34 & 35 T 37 N of R 10 E

(P. 194)

thence from the corner of fractl sect  
34 & 35 T 37 N of R 10 E

	C. L.
N 12 E	20 62
N 22 E	12 50
N 39 E	10 21

---

43 33

467c intersected the corner of  
fractl sect. 26 & 35 T 37 N of R 10 E  
(P. 195)

thence from the corner of fractl sect  
26 & 35 T 37 N of R 10 E

	C. L.
N 37 E	12 00
N 23 E	05 42
N 39 E	10 00
N 48 E	13 00
N 69 E	07 50
N 43 E	12 00
N 55 E	11 66
N 81 E	09 60
S 86 E	06 25

---

87 43

intersected the corner of fractl sect  
25 & 26 T 37 N of R 10 a few chains  
below this intersection is the head of  
the lake spoken of before

(P. 196)

thence from the corner of fractl sect  
25 & 2 T 37 N of R 10 E

C. L.

N 64 E	09 31
N 70 E	07 76
N 79 E	15 73
N 60 E	05 50
N 43 E	13 60
N 53 E	06 00
N 66 E	09 90

---

67 80

intersected the corner of fractl  
sect 24 & 25 T 37 N of R 10 E  
here is a small lake in the River

(P. 197)

thence from the corner of fractl sect  
24 & 25 T 37 N of R 10 E

C. L.

N 66 E	06 00
N 77 E	11 00
M	
N 66°30 E	06 00

---

23 00

intersected the corner of  
fractl townships 37 & 37 N of Rs 10 & 11  
E on the N W bank of the Illinois river

10th October 1821

(Vol. 247, p. 143)

Meandered down the Laplain  
N side through Sect No 1 town  
No 37 N R 11 E

Course C. L.

S 79 W 11.50

N 83 W 12.50

S 70 W 7.65 to the cor of F Sect 1 & 12

Land bottom soil good beaver bush & willow very  
thick Tim'r hickory elm ash maple oak &c thence  
through Sect 12

S 48 W 8.50

S 31 W 8.50

S 67 W 7.50

	S 79 W	4.00
	S 48 W	4.40
	S 39 W	8.50
	S 54 W	4.50
	S 36 W	2.50
467e	S 58 W	5.00
	S 76 W	10.66 to the cor of F sects 11 & 12
	Last similar to the last & timber also	
	Oct. 11th 1821	

## JNO WALLS

(P. 144)

Continued through Sect 11

S 46 W	13.50
S 14 W	8.00
S 40 W	7.15
S 61 W	16.00
S 73 W	16.05
S 49 W	7.50
S 65 W	5.65
S 89 W	4.85
S 68 W	7.83 to the cor of F Sect 11 & 14

Land low wet bottom undergrowth very  
thick timber ash elm maple oak hickory &c  
the River is very & swampy lower end  
Continued through Sect 14

S 51 W	9.77
S 56 W	5.44 to the cor of F Sects 14 & 15

Land wet prairie

Continued through Sect 15

	S 53½ W	6.00
	S 42 W	9.50
	S 16 W	7.15
	S 43 W	5.00
	S 85 W	9.06
	S 53 W	11.50
	N 89 W	14.25
	S 47 W	2.50
	S 52 W	13.00
	S 62 W	4.00
467f	S 61½ W	18.00 to the cor. of F Sects 15 & 16
	207.70	

Land principally prairie undergrowth  
in many places very thick



(P. 145)

Continued through Sect 16.

S 70½ W 18.97

S 83 W 5.00

S 67 W 8.50

S 68 W 5.00

S 68½ W 5.50

S 47 W 4.00

S 34 W 5.50

S 13 W 1.11 to the cor. of F Sect. 16 & 21

Land similar to last the River a continued  
chain of Swamp pond and lakes

Continued through Sect 21

S 11½ W 7.00

S 4 W 7.50

S 27 W 8.00

S 53 W 13.50

S 84 W 6.50

N 44 W 2.83

N 34 W 17.00

N 9 E 3.27

N 3½ W 5.94 to the cor. of F Sects. 20 & 21

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125.12

Land & similar to last & river also

Oct. 12th 1821 Jno Walls

(P. 146)

continued through Sect 20

N 75 W 12.00

S 73 W 10.00

W 10 W 9.13

S 18½ W 7.50

S 26 W 10.00

S 55 W 7.83

S 48½ 8.50

S 37 W 6.00

S 17 W 7.50

S 59 W 14.75

N 88½ W 9.50

N 78 W 9.92 to the cor of F Sects 19 & 20

Land prairie very wet soil

Continued through Sect 19

S 89½ W 12.50

N 59½ W 10.50

N 56½	W	13.66
S 49½	W	6.50
S 39	W	10.00
S 20	W	6.50
S 45	W	1.50
S 38	W	6.00
S 68	W	13.66
S 59	W	8.59 to the cor of F Sects 19

---

 202.04

& 24 on the Range Line between 10 & 11 E  
 Land very wet prairie River continues wide & swampy  
 (P. 147)

Meandered up the South side of the Laplain  
 through Sect 30

Course	C.L.
N 57 E	00.43 to the cor of F Sect 19 & 30

Continued through Sect 19

467h

N 70½	E	6.00
N 77	E	14.50
N 86	E	7.50
N 58	E	10.50
N 46	E	4.50
N 15	W	4.38
N 44	W	5.00
N 18	E	4.50
N 49	E	3.50
N 89½	E	3.13
S 60	E	5.20
S 38	E	2.83
S 25½	E	6.00
S 52	E	6.00
N 66	E	10.50
S 80½	E	11.60 to the cor of F Sects 19 & 20

Land low wet prairie very swampy

Continued through sect 20

S 83	E	20.00
N 71½		6.68
N 53	E	7.00
N 43	E	8.00
N 51	E	4.67
N 32	E	7.20
N 73½	E	11.00

N 56½	10.00
N 49½	10.50

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191.43 Carried over  
(P. 148)

S 85½	9.60 to the cor of F Sects 20 & 21
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Land very low & wet mostly prairie  
River in many places 20 & 30 chains wide  
Continued through Sect 21.

467i

S 33 E	9.00	
N 86 E	12.00	
N 63½ E	14.50	
N 51½ E	9.16	
N 26½ E	8.50	Oct. 13th 1821
N 13 E	5.50	Jno Walls
N 22 W	3.50	
N 22 E	5.50	
N 48½ E	3.75 to the cor of F Sects 16 & 21	

Land & River similar to last  
Continued through Sect 16

N 40½ E	4.50
N 81½ E	10.25
S 77½ E	5.00
N 86½ E	7.50
N 75 E	6.76
N 78 E	2.47 to the cor of F Sects 15 & 16

Land & River similar to last  
Continued through Sect 15

S 76 E	7.21
S 70½ E	4.50
N 89 E	11.50
N 87½ E	7.00

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147.70 carried up  
(P. 149)

N 82 E	8.00
N 56 E	4.00
N 34½ E	4.00
N 41½ E	5.83
N 47 E	3.68
N 69 E	3.71
N 76½ E	5.50
N 73 E	7.16

467j

*Complainant's Evidence.*

N 57½ E	4.00
N 28 E	8.36 across an inaccessible swamp
N 4 E	5.50
N 85 E	6.47 to the cor of F sects 14 & 15

The River is very wide an inundated Island  
laying opposite this line  
land a wet marsh

Continued through Sect 14

N 79½ E	2.50
N 64½ E	8.30
N 71 E	10.00
N 57½ E	4.50
N 41 E	6.27
N 43½ E	6.17
N 57 E	9.40
N 40 E	7.50
N 19½ E	5.20
N 3½ E	4.50
N 5½ E	5.63 to the cor of F Sects 11 & 14

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136.18

Land & Prairie similar to last

Oct 14th 1821 Jno Walls

(P. 150)

Continued through Sect 11.

N 6 W	3.00
N 16½ W	3.08
N 58 E	4.50
N 75 E	15.00
N 59½ E	4.50
N 51½ E	5.20
N 44 E	2.19
N 28 E	6.15
N 39 E	2.50
N 22½ E	3.50
N 6 W	3.21
N 18½ E	2.11
N 37½ E	2.46 to the cor of F Sects 11 & 12

This line is low & wet Tim'r oak hicky ash  
elm maple linn &c. beaver or swamp bush almost  
inaccessible

Continued through Sect 12

N 61 E	6.50
N 74½ E	6.50

N 69 E	5.50
N 51 E	4.29
N 28 E	4.22
N 35 E	9.14
N 85 E	6.62
N 63½ E	6.50
N 28 E	4.40
N 37 E	11.00

122.87      carried up  
(P. 151)

N 60 E	5.31
N 73 E	5.50
S 81 E	11.30
N 82½ E	7.50
N 62½ E	3.59 to the cor of F Sects 7 & 12

on the line between Ranges 11 & 12 East  
Tim'r undergrowth & land similar to last  
Continued up same side  
through Sect 7 T 37 N R 12 E

4671

Course      C. L.

N 71 E      2.50

N 67 E      2.82 to the Cor of F Sects 6 & 7

Continued through Sect. 6

N 73 E	9.00
S 84 E	3.00
N 75 E	6.00
N 63½ E	7.50
N 18 E	4.00
N 37 E	6.00
N 38½ E	8.00
N 58½ E	11.50
S 80 E	5.50
S 40½ E	9.00
N 89½ E	8.00
N 65½ E	12.00
N 52½ E	9.59 to the cor of F Sects 5 & 6

Land Rock bottom Tim Oak hicky ash elm linn  
mple &c

(P. 152)

Continued up through Sect 5

N 44 E	3.00
N 31½ E	9.00
N 70½ E	20.25

	N 30 E	2.22	
	N 11 E	2.50	
	N 9 W	3.60	across the swamp
	N 17 W	2.33	
	N 6 E	3.66	
	N 19 E	7.00	
	N 2 E	8.19	
	N 62½ E	12.83	
467m	N 26 E	2.33	to the cor of F Sects 5 & 32
	on the line between Towns 37 & 38 N R 12 E		
	Land & timber similar to last		
	Continued through Sect. 32 T 38		
	N R 12 E up same side		
	Course	C. L.	
	N 51 E	6.00	
	N 42½ E	12.50	
	N 46 E	4.39	
	N 51 E	5.50	
	N 48½ E	6.30	
	N 50 E	5.50	
	N 50½ E	9.11	to the cor of F sect. 32 & 33
		128.21	
	Land very low swamp prairie near the River.		
	(P. 153)		
	Continued through Sect 33		
	N 45½ E	7.50	
	N 49½ E	6.00	
	N 66½ E	7.00	
	N 61 E	6.00	
	N 67½ E	8.00	
	N 71 E	9.00	
	N 54 E	6.50	
	N 48½ E	9.00	
	N 44½ E	9.54	Oct. 15th 1821
	N 29 E	6.00	Jno Walls
	N 55½ E	5.50	to the cor of F Sets 28 & 33
	Land similar to last very swampy		
467n	Continued through Sect 28		
	N 53½ E	5.50	
	N 65½ E	8.00	
	N 88 E	6.42	to the cor of Fractl
		99.90	to Sects 27 & 28

Land similar to last River is very wide  
rather a lake or swamp

(P. 154)

Continued through Sect 27

N 53 E	13.00
N 30½ E	8.50
N 51 E	8.00
N 40 E	10.00
N 40 E	9.00
N 26 E	11.50
N 2 E	8.50
N 46 E	9.50
N 63 E	4.50
N 9 W	7.00
N 48 E	5.00
N 40 E	2.28 to the cor of F Sects 22 & 27

Land & River similar to last very wide

Continued through Sect 22.

N 30½ E	8.50
N 14 E	8.50
N 31½ E	7.50
N 11½ E	11.00
N 5 E	8.00
N 15 E	7.50
N 6 W	1.50
N 23 E	3.50
N 56 W	3.40
N 16 E	2.00
N 25 E	5.50

163.68 carried up

(P. 155)

C. L.

N ½ W 11.00

N 35 E 9.67 to the cor of F Sects 15 & 22

Land similar to last low prairie

River very wide

Continued through Sect 15

N 33½ E 4.06 to the cor of F Sects 14 & 15

Continued through Sect 14

N 53 E	5.50
N 35½ E	9.00
N 48 E	10.00
N 45 E	26.50



N 56 E	7.50
S 78 E	5.68
N 66 E	4.11
N 26½ E	4.80
N 17 E	2.56
N 12 W	3.68
N 38 E	3.00
N 22½ E	5.37
N 22 E	3.50
N 30½ E	3.72
N 29 E	5.00
N 21 E	5.50
N 65 E	6.06 to the cor of F Sects 11 & 14

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 136.22

467p Land prairie rather more high and dry  
a little timber on the River in places  
(P. 156)

Continued through Sect 11

N 60 E	4.50
N 47 E	6.39
N 22 E	3.16 to the cor of F Sects 11 & 12

Land similar to last

Continued through Sect 12.

N 10 E	1.95
N 17 E	4.00
N 3½ E	6.00
N 7½ W	7.24
N 69 E	2.55
S 39 E	3.50
S 47½ E	7.50
S 77½ E	2.50
N 77 E	2.86
N 48 E	6.50
N 52 E	6.50
N 42 E	3.75
N 21 E	3.50
N 19 E	8.00
N 57 E	5.81
N 85½ E	4.15
N 82 E	3.50
N 80 E	5.00
N 64½ E	13.00

*Meander Desplaines River.*

2337

N 67½ E 5.79  
N 54 E 6.00

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123.63 carried up  
(P. 157)

467q

N 32½ E 3.50  
N 18 E 4.47 across the portage  
N 33½ W 5.71 creek or swamp  
N 38 W 3.50 Oct. 16th 1821  
S 52 W 4.00 Jno Walls  
N 36 W 2.50  
N 1½ E 5.30  
N 5½ W 1.82 to the cor of F Sects 1 & 12

---

30.81

Land level prairie some scattering tim'r on  
the River soil good

Continued through Sect. 1.

N 7 E 1.75  
N 20 W 3.84  
N 26 W 2.90  
N 41 W 4.50  
N 6½ E 2.00  
N 84 W 2.38 across a swamp  
N 54 W 2.25  
N 8 E 2.50  
N 6 E 16.00  
N 4 W 17.00 Land high & dry soil  
N 18 E 5.00 good 2nd rate Tim'b B & W oak  
N 43 E 6.50  
N 5 E 7.50  
N 28½ W 10.00  
N 41½ W 4.00  
N 66½ W 2.37 to the cor of F Sect 1 on

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91.39

the town line between Towns 38 & 39 R 12 E

(P. 158)

Meanders down the N side of Laplain through  
Sect No. 1 T 38 N R 12 E from the head of navigation

467r

S 34 E 4.06  
S 48 E 6.00  
S 24 E 2.65  
S 43 E 6.93

*Complainant's Evidence.*

S 15½ W	5.00
S 30½ W	7.50
S 3½ W	13.00
S 13 E	3.50
S 5½ W	13.00
S 7 W	7.00
S 18 W	8.76 Oct 17th 1821
S 41½ W	4.21 Jno Walls
S 6 E	7.23 to the cor of F secs 1 & 12

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 88.84

Land high level prairie a little timber lower  
end on the Bank of the River

River crooked wide & swampy

(P. 159)

Continued through Sect. 12

S 18 E	3.50
S 33 E	4.50
S 42½ E	6.00
S 56½ E	4.50
S 73½ E	4.00
S 88½ E	3.50
N 80 E	5.60
S 58½ E	3.00
S 14½ W	3.65
S 34 W	3.18
S 68½ W	4.00
S 81½ W	3.50
S 62½ W	3.50
S 64 W	4.00
S 66½ W	7.50
S 73½ W	3.50
S 86½ W	4.50
N 84 W	5.21
S 58 W	4.10
S 26 W	3.50
S 19½ W	3.20
S 25 W	2.31
S 7½ W	2.70
S 25 W	3.06
S 47½ W	5.50

467s

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 101.51 continued over

(P. 160)

S 55 W	1.62
S 52½ W	4.50
N 55 W	1.87
N 43 W	4.34
N 3 W	2.73
N 50 W	1.83
N 64½ W	4.16 across the mouth of

21.05 a swamp to the cor  
of Fractl Sects 11 & 12 River crooked & Swampy  
soil rather wet mostly prairie  
Continued through Sect 11.

S 59½ W	5.64
S 26½ W	4.56
S 13½ E	5.50
S 8 E	4.00
S 6½ W	3.22
S 13½ W	5.00
S 42 W	6.14
S 59 W	6.14
S 59 W	5.03
S 71½ W	2.21
S 69 W	3.22 to the cor of F Sects 11 & 14

467t

44.52

Land similar to last a little scattering  
timber in places on the River

(P. 161.)

Continued through Sect 14.

S 25½ W	5.50
S 26½ W	5.50
S 27½ W	4.50
S 18 W	4.00
S 18½ W	3.69
S 32½ W	2.05
N 81½ W	2.63
N 89½	4.22 across the mouth of
S 46 W	3.00 a swamp
S 69½ W	3.83
S 51 W	15.00
S 45 W	21.00
S 39 W	15.21 to the cor of Fractl

91.13 Sects. 14 & 15

Land Low but dry prairie soil good

Continued through Sect 15.

S 40 W 12.26

S 39 W 11.71 to the Cor of Fractl

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23.97 Sects 15 & 22

Land similar to last

(P. 162)

Continued through Sect 22

467u

S 28 W 11.00

S 12½ E 7.17

S 54 E 3.50

S 7 W 8.24

S 6 W 6.50

S 17½ W 7.00

S 9 W 7.50

S 25½ W 9.37

S 41 W 4.71

S 20 W 14.19

S 38½ W 9.17

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88.35 to the cor of F Sects 22 & 27

Land very low & wet prairie

Continued through Sect 27

S 34 W 9.15

S 30½ W 7.00

S 27½ W 8.20

S 31 W 7.41

S 48½ W 9.50

S 44½ W 9.30

S 53 E 7.71

S 48 W 9.19

S 51½ W 1.20 to the Cor of Fractl

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68.66 Sects. 27 & 28

Land similar to last

River wide & Swampy

(P. 163)

Continued through Sect 28.

S 46½ W 7.81

S 55½ W 4.70

S 64½ W 7.19

S 44 W	10.00
S 41 W	10.60 to the Cor of Fractl

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40.41 Sects 28 & 33

467v Land very low & swampy  
immediately on the River a swamp  
Continued through Sect 33

S 37 W	5.74
S 39½ W	8.00
S 52½ W	8.32
N 84½ W	5.00
N 33½ W	2.00
N 8 W	3.18
N 44½ W	2.23
S 55 W	3.75 Land similar to
S 47½ W	5.00 last mile
S 42 W	5.00
S 42 W	5.50
S 43 W	5.50
S 45½ W	7.00
S 51 W	7.60
S 43½ W	4.34 to the Cor of Fractl

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73.16 Sects. 32 & 33

(P. 164)

Continued through Sect 32

S 43 W	7.50
S 48 W	7.50
S 47 W	13.00 entered timber
S 46½ W	16.50
S 39½ W	8.24 Lower end of this line is
S 43 W	5.84 timbered oak hickory ash
S 50 W	3.50 elm &c.
S 64½ W	1.60 to the Cor of Fractl

Sects 5 & 32 on the

Line between Towns 37 & 38 R. 12 E

Continued down same side

through Sect 5 T 37 N R 12 E

467w

S 60½ W	9.00
S 24 W	9.24
S 19½ E	3.50
S 11½ W	3.50
S 23 W	3.64

*Complainant's Evidence.*

S 1 E	6.50
S 11½ W	5.50
S 74½ W	8.50
S 71½ W	12.00
S 48½ W	1.86 to the Cor of Fractl

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 127.01 Sects. 5 & 6

 River banks very low Tim'r  
 oak ash maple linn hickory

(165)

Continued through Fractl Sect 6

S 48 W	5.56
S 28 W	5.00
S 42½ W	4.00
S 62½ W	5.14
S 89 W	3.50
N 36 W	3.00
N 27 W	3.74
N 61 W	0.37
S 73 W	6.90
S 50½ W	10.50
S 38 W	3.84
S 46 W	2.72
S 53 W	6.35
S 37 W	7.79
S 71½ W	7.21
S 88½ W	6.10
S 65 W	6.50
S 56½ W	3.70 to the Cor of Fractl

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 100.92 Sects 1 & 6 on the

467x line between Ranges 11 &amp; 12 E

Place of beginning

Land low & wet Tim'r oak  
hickory ash maple &c

Oct. 21st 1821

JNO WALLS

(P. 166)

 The river throughout  
 the greater part of those towns is  
 a mere connection of lakes ponds & swamp  
 in many places very wide

JNO WALLS



467y

STATE OF ILLINOIS

AUDITOR'S OFFICE.

Springfield, May 9th, 1908.

I, James S. McCullough, Auditor of Public Accounts of the State of Illinois and Keeper of the Seal of the Office of Auditor of Public Accounts of Illinois, and by law custodian of the field notes and plats of the United States surveys of lands in Illinois, transferred from the United States Surveyor General's office to this State pursuant to an Act of Congress, do hereby certify that the foregoing is a true, correct and complete copy of all the said field notes of the survey of the Illinois river and River Laplain from its mouth or junction of said river with the Kankakee River in Sections Twenty-five (25) and Thirty-six (36), Township Thirty-four (34) North, in Range Eight (8) East of the Third Principal Meridian as far north as the northern boundary line of Township Thirty-eight (38) North, Range Twelve (12) East of the Third Principal Meridian, being all of the field notes contained in the volumes and pages hereinbefore specified, all of which appears from the records of the field notes of surveys on file in this office.

In Testimony Whereof, I hereunto subscribe my name and affix the seal of my office, the day and year first above written.

J. S. McCULLOUGH

(Seal)

*Auditor of Public Accounts.*

467z STATE OF ILLINOIS, } ss.  
SUPREME COURT.

I, J. McCan Davis, Clerk of the Supreme Court of the State of Illinois, and keeper of the records and seal thereof, do hereby certify the above and foregoing to be a true copy of Field Notes Exhibit 1 contained on pages 5720 to 5770 inclusive of the transcript of record in a certain cause entitled in this Court The People of the State of Illinois ex rel Charles S. Deneen, Governor and William H. Stead, Attorney General No. 6242 vs. The Economy Light & Power Co. filed in this office on the 16th day of November A. D. 1908.

Witness my hand and Seal of said Supreme Court at Springfield, in said State this 27th day of September A. D. 1911.

J. McCAN DAVIS

(Seal)

*Clerk.*

The certificate attached to said Field Notes as originally introduced by counsel for the State of Illinois reads as follows:

“STATE OF ILLINOIS,

Auditor's Office,

Springfield, December 9, 1907.

468 I, James S. McCullough, Auditor of Public Accounts of the State of Illinois and by law custodian of the field notes of surveys of lands in Illinois, do hereby certify that the foregoing is a true, correct and complete copy of the field notes of the meander survey of the Illinois River and the river Des Plaines, from its mouth or junction of said river with the Kankakee River in Sections 25 and 36, Township 34 North, Range 8 East of the Third Principal Meridian, as far north as the northern boundary line of Township 38 North, Range 12 East of the Third Principal Meridian; all of which appears from the records of the field notes of surveys on file in this office.”

In connection therewith, counsel for complainant read 468a the statute entitled “An Act to Revise the law in relation to County Surveyors and the Custody of the United States field notes, approved March 2, 1874, in force July 1, 1874”:

“Section 10. As soon as the present custodian of the original field notes of the United States surveys transferred from the United States Surveyor General's office to this state, pursuant to acts of Congress, shall complete the copying thereof pursuant to law, and the New State House is ready for occupation by the State officers, said custodian shall deposit said field notes and the said copies and all papers and documents pertaining thereto in the office of the Auditor of Public Accounts, thereupon the office of said custodian shall keep and said field notes and copies shall be and remain in the custody of the Auditor of Public Accounts and copies thereof made and certified by him under this official seal shall be competent evidence.”

Upon objection by counsel for defendant, after some colloquy between counsel the court said:

468b “The COURT. All right. Then it is stipulated by counsel that the document now introduced— We will come to whether the title page is to be excluded, in a

moment—excluding the certificate, excluding the cover written in counsel's office, is a correct copy of the original field notes of the original government survey, deposited in accordance with the law with the Auditor of Public Accounts; counsel for defendant, however, reserving their objections as to the competency of a copy of the original field notes being admitted in this case. Excluding also the title page of said copy, placed thereon by the Auditor."

Here follows an explanatory note stating that the said field notes "Exhibit 1" and the other documents and documentary evidence offered or introduced in evidence herein, which are not set forth in connection with the statement herein are set forth in this certificate of evidence at the close of the testimony in the appendix hereto marked "Appendix II."

Said explanatory note also states that proper references are made to said "Appendix II" and the documentary evidence therein set out are incorporated in said certificate of evidence by such references at the place of its offer and introduction and a reference to each of the said exhibits by the page of said "Appendix II" where it so appears, follows the statement of the offer or introduction of each of said exhibits, thus Field Notes Exhibit I.

Thereupon counsel for complaint had marked for identification "Survey Exhibit 4."

And thereupon the witness testified as follows:

My name is Emil Rudolph, age fifty-three, residence, 477 Highland Park, Lake County, Illinois; my occupation, land surveyor. I have been engaged in the business of surveyor since 1871.

478 The principal part of my work is in establishing boundary lines, the lines of lands and many larger surveys of the railroads and parks and cemeteries. Anything in the surveying line, locating the meander lines of lakes and rivers.

I have been compelled to become acquainted with and have become acquainted with the plats, maps and rules of the office of the United States Government in charge of land surveys in Illinois, made by and under the direction of the surveyor general.

These documents, Field Notes, Exhibits 1, 2 and 3,—  
484 for instance take the one marked Exhibit 2, I see in the first page there in parenthesis, Volume 250, page 263, and then the legend, "Meander by the S. bank of Illinois River,

in Sec. No. 26, T. No. 34, N. R. No. 8 east." Below that there is a column—there are columns "N. E. 81 E." and opposite that eight and two ciphers. Below that N. 84 E. and to the right of that five and two ciphers.

486 N. 81 means North 81 degrees east, that is the course as run; eight and two ciphers means 8 chains. North 81 east is the course and 8 chains is the distance, which this course is measured to the next course. The other abbreviations have the same meaning, right through until they strike the corner post, the section corner.

Volume 250, page 263, means the volume of Government plat books, or Government surveys, and the page is the page number of that volume, where these Government field notes appear.

"Meander by the S. bank" means meander by the south bank of the Illinois River; in Sec., that is in Section 26, T. is Township; No. 34 N. is north; R. is range, No. 8 E. is east; and then the courses and distances follows. That "east" means east of the third principal meridian.

487 "Meander by the south bank," as understood by surveyors—as the running of a line taking its course and measuring its distance from some given starting point and continuing on to the ending point. That I would call surveying a meander line, and is generally applied as the meander line of the river, or lake or body of water, and the margin of the body.

The meander line is indicated on this map by the border lines of the stream itself. The map is drawn on a scale of two inches to the mile and makes it too small to admit of any specific marking.

490 The map indicates the meander line, the way that the Government survey plats indicate the meander line. They show the location of the river in a general way by showing the direction and course between two meander posts in the section.

I have tested the map by actual survey. The map shown me together with the field notes that have been shown me of the meander line of the Desplaines River in Section 25, Township 34, Range 8, ascertain or make certain the location of the meander line of the Desplaines River in that section.

I can from these field notes which have been shown me and from this plat which has been shown me find a meander line located by them.

492 Looking at Section 25, Township 34, Range 8, shown on this plat, I observe on the northeast quarter the phrase abbreviated "160 Ac."; the northeast quarter is 160 and in the southwest is 146.24; in the northwest is 101.90; in the southeast is 94.41. The figures represent the area of the different fractional quarters, in acres. The area which is covered by a pale blue band which is labeled the name of the river would be outside of the meander line. On several other sections the legend 640 acres means that the section contains 640 acres. Sections 34 and 35 in Township 34, Range 8, 493 each contain 640 acres by Government survey, being a full section.

In laying out a township, that is, what is called a Congressional township, when it is full there are thirty-six sections in it, six miles square or thirty-six miles in the section.

Commencing in the northeast corner, the sections run west, to six, then seven below it, and then east to twelve, and so alternate to the 36th, and 36 is the southwest corner. If the township is not full, so that some of the sections in it will not contain the 640 acres, if it is short north and south, the fractional sections will appear along the north line of the 494 township. And if the township is short east and west the fractional lines will appear along the west tier. The sections on the east side of a township south of Section 1 will be full, if there is area enough to make them full; and the first one to be made full is section thirty-six and the next one running north and south, twenty-five.

For instance, here in Township 35, Range 9, I notice the acres given on the top here of sections there, Section 1, 640A, Section 2 640A, Section 3 640A, Section 4 640A, Section 5 640A, and when you come to Section 6 the acreage is given as 563.96. The excess or the deficiency in surveying the township is thrown into the west tier of sections, east and west. In this case there seems to be a deficiency. So that the whole tier of sections on the west side of that township—is a 495 fractional tier.

Aside from the last one or two questions wherein I have been shown an illustration of what I have said, my answers have been made and are concerning the map that is marked, "McCullough Exhibit One," and the one which was before me when the last three answers were made is marked 496 "McCullough Exhibit 1A" (Atlas page 3914), counsel for complainant explaining that these two maps are iden-

tical and both were certified to by Mr. McCullough, but Mr. Ezra Williams has delineated upon there a lot of loose material that has come out in the other evidence, upon one of them,—by “loose material” meaning material not delineated with any of the rest of the material until Mr. Williams delineated it upon this.

The reason why the surveyors made the difference in 497 this particular section twenty-five, giving 160 acres to the northeast quarter of the section and the lessor amount to the other three-quarters of Section 25,—because the section is a fractional section, being fractional on account of the river running through it, the meander of the river running through it and the fractional parts, the areas constitute, as I have said before, the lines within the section line and the meander line. These figures, in the different fractional quarter sections of Section 25, Township 34, Range 8 East, indicate the area of any acres of land within the meander line of those several quarters. Section 25 is a 498 fractional section. It should be a full section according to Government surveys. The balance of the area that would make up the 640 acres of the section, not mentioned in these figures, indicating the several amounts in the several fractional quarters is to be found in the river and between the edges of the river and the meander line.

There is a little patch that has not been mentioned (indicating on plat), twenty-six acres, twenty acres and a fraction, there on the south, and the figures that have not been mentioned by anyone appearing in the southeast corner.

The acreage shown on this map in the several quarter-sections of it, within the meander lines, are as follows: In the northeast quarter, 160 acres, in the northwest quarter 500 101.90 acres, in the southwest quarter 146.24, and in the southeast quarter, that part of it north of the Desplaines river and east of the Illinois 94.41 acres, and that portion of the southeast quarter of said section line, south of the Desplaines river is 20.30 acres.

A-146.24 includes both the southwest fractional quarter and also this very small part of the northwest fractional quarter, which lies south of the river,—that is a common practice to include the fraction of the adjoining part; it takes in all of the south fraction there, half or quarter, we will call it, lying west or south of the river.

501 A different method was pursued in indicating the small area in the southeast quarter, that is 20.30, which lies



south of the junction of the two rivers, and that wasn't connected with the tract which is immediately below it, because that is in a different section.

From the field notes, and the McCullough Exhibit 1, the streams which are shown to be present in Section 25, Township 34, Range 8, have been meandered by the surveys of public lands of the United States.

502 There is not anything called for by the expression "meandered by the surveys of the public lands of the United States" which is absent from the field notes and this plat (McCullough Exhibit 1).

Thereupon McCullough Exhibit 1A and McCullough Exhibit 2A, were admitted in evidence, the court reserving the question of striking off certain annotations thereon, which plats appear in the Atlas, Vol. 2 of the Certificate of Evidence, at pages 3914, 16, respectively.

This map taken in connection with the field notes of the survey does show all facts placed on maps pertaining to a meander line made by the general government on this scale as a part of the survey of vacant public lands to be offered for sale.

The COURT. That is on the basis that this map has been admitted under this understanding.

It is possible to retrace the original meander line in Section 25, Township 34, Range 8, from these notes. I have re-traced them by survey. I have a plat of my surveys on a larger scale. It is this which is now produced (Exhibiting plat to witness), bearing also the legend "Plat Survey of the North Fraction of Section 25, abbreviated, Township 34, N. R. 8-E, of the Third Principal Meridian, surveyed April 13th to 23rd, 1908, by Emil Rudolph and H. H. Bremer, Surveyors,"—which said map was received in evidence and 515 marked "Rudolph Exhibit 1" (Atlas, p. 3941).

Mr. Bremer is a surveyor who is associated with me in this survey. We together made this survey. The meander line in this section as run by me is indicated upon this 516 plat "Rudolph Exhibit 1." (Pointing to map.) The line drawn from A to B indicates the Government meander line from the Government field notes. It is a line made of dots and lines, in black, connected by circles when the line changes. Different courses and distances are shown beginning with South 28-E, one chain, and fifty links. Thence south—Well, I am going the wrong way according to the Government; we had better begin at the west end.



The point B is the west line of Section 25, and the meander post of the river. Beginning at that point the course is South 76 degrees east, 13 chains. This is the course that 517 is followed and delineated on this map. That is a true and correct delineation or platting of the Government meander line.

As to the area enclosed by the double line near the junction of the Desplaines and Kankakee, labeled here Desplaines river and mouth of Kankakee, and near that place there is a double line describing a rude trapezoid, labeled "Coffer Dam."

The coffer-dam is the lower part that has not been washed away, and the side, the east side shows stone and earth, or earth on the bottom, I think, and stone piled on top, enclosing the space as shown by this double line. There was a coffer-dam there when I made this survey. My survey correctly indicates the situation and dimension of the coffer-dam and the area included therein, by scales.

518 There is something more on the map. On the right hand end of the map, I see another representation which is marked on the scale 400 feet to the inch. This separate representation over here (indicating) represents the survey of the north fractional part of the section, or all that part of Section 25, lying northerly of the Desplaines and the Illinois river. That merely shows the section and is a sort of a key to the larger map, showing where the meanders have 519 been taken.

These lines on this, which I have described as meander lines, represent the position of the retraced meander line of the Government. Taking the original Government field notes as a basis, and for the test and actual survey that I have made, I would say that these meander lines had actually been run. I did go to Springfield and examine the originals of these field notes in the auditor's office. I compared these documents, these field notes, field note exhibits that are produced here, with the originals in the office of the auditor. These field notes exhibits that are produced here are true copies of the originals in the auditor's office.

520 The map is correctly drawn to a scale of 100 to the inch throughout that towpath bank there, from the water's edge on the one side to the water's edge on the other.

As to the conditions that I found,—the tow bank of the canal is the same throughout with the exception at various points along the line there were deposits of stone in places,

widening the tow bank of the canal, and in some places dumped on the river side of the canal. The tow bank or tow-path is probably three or four feet above the water in the canal and as much as twenty feet, I should say above the river bank. I have taken the levels there, but I do not remember the exact figures.

The stone that had been placed there on the towpath, was a sort of a sandstone, bluish sandstone of a very poor  
521 character, and seemed to scale off. I think the stone was perishable because it scaled off. If you took a piece up and dropped it, it would break in pieces almost like glass. It was just turned on loosely as though it had been dumped from a car and leveled off in a loose way. There was not anything in the nature of riprapping about it.

Thereupon it was agreed by counsel that the writing on the left under the head of "Areas" and on the right hand margin, that which is marked "Note" shall be omitted; and the balance of McCullough Exhibit II remain, and it is agreed that it is a correct representation of what it purports to be.

*Cross-Examination.*

522 I profess to know what rip-rapping means only from  
523 a layman's standpoint of view. I have never examined any dictionary upon that point. I do not profess to be so acquainted with the meaning of that term as that I would set up my definition as against Webster's for instance, if Webster said loosely thrown in. As to how many pieces of that stone I did examine,—I saw it all along the line. I took it up to find out whether it was brittle and would break  
like glass probably a dozen pieces.

524 As to whether there are different strata there, some of which are soft and some of which are hard sandstone, —these I examined were all soft.

In the map that I have prepared, which is purporting to show the meander line, the line of the river shown there is the line of the river as it is now. I did not undertake to ascertain the line of the river before the drainage water was turned into the river. The line of the river that I have shown is the water line, the edge to which the water comes at the time I made the survey, as near as I could get it. The meander line does not conform to the edge of the water. A meander line in its nature can conform to the edge of the water, at

only very few places, perhaps; it may touch,—as a matter of fact a meander line is ascertained and determined by running straight lines between points shown by the field notes, 525 so that it does not conform to the line of the river precisely. I said in direct examination the meander line of the river was indicated by the lines of the stream itself.

Upon this map, McCullough Exhibit 1, the lines of the stream are not shown any differently. If the stream had not been meandered, the line of the stream would be just as it is now, so that there is nothing in the mere line of the stream itself to show that the river has ever been meandered.

526 The Du Page river is not meandered and the lines showing the borders of that stream are no different from the lines showing the borders of the Desplaines. These field notes take in the shoal of the Desplaines river from Section 25, Township 34, 8 to the north line of Township 38. That would be about the line of 39th street in the Town of Lyons, extended west to the Desplaines river.

527 I could as well draw a meander line from field notes up to the south line of Riverside as I have been able to down below. The section corners as shown upon that plat are the northwest corner of Section 25, stone, northwest corner of Section 25, 34, 8, as whether any of them correspond to the fence corners on the actual ground, I relocated the northeast corner of Section 25. I found nothing there in the way of a monument, nothing but old occupation fences. The southeast corner of Section 25 came in about the middle of the Illinois and Michigan Canal.

528 Well, take here on the upper left hand corner, the line running diagonally across, the Government measurement equals 5,313 feet. I made that measurement 5,333-4/10. It is not true that that line should be 5,280 feet. I relocated all those lines in Sections 24 and 25. I made a survey of the whole section, say 24, located all the occupation. Then I surveyed the whole of Section 25 in which this meander line is located, surveyed part of 36, also part of the section east of Section 24. My starting point when I first started in the survey was beginning at a stone at the northwest corner of Section 25. That was the first monument that I started from, that is a known monument. From there I measured north and across to the northwest corner of Section 24. I

529 did this in order to get a certain check on my lines by taking in all of the occupation in these different sections, and in this way I was enabled to locate the section corners that were lost or that could not be found.

I have never seen a survey by the United States on which the meander lines of this river were actually extended. I don't know as any such map exists. I would be likely to know if it did. The Land Office of the United States for Illinois and Missouri was located at St. Louis. I never knew of any such land office being located in the State of Illinois.

You understood me correctly that I made an accurate survey of that coffer-dam, and that that portion of it referring to the coffer-dam actually represents it to a scale. 530 We made the measurement.

*Re-direct Examination.*

Directing my attention to McCullough Exhibit 2, as to the subject which I was cross-examined about, on the east and west line between Township 38 and Township 39, in Range 12, a little to the west of the divisional line between Range 12 and Range 13, I can locate upon that line between Townships 38 and 39 the point up to which the river was meandered, according to the field notes, as far north as the north line of Section 1, Township 38, Range 12, to the asterisk 531 placed on that line, part of the exhibit (point to the asterisk). I have seen the government plat of the Desplaines river north of that point. I have got a copy of that. It is in the other room there. (Witness produces a plat.) The number of the section is Township 39, Range 12 East, that lies directly north of Section number one in Township 38, Range 12 East is Section 36, Township 39, Range 12. In this book which I might call plat book, the label here at the top of this page 12 is a plat of Township 39, north of the base line in Range 12 East of the third principal meridian, south-east of the old Indian Boundary line.

The line between Section 36 of this page 12 of this plat book is the same line as the north line of Section 1 in Township 38, Range 12. This wavy line that comes up through Section 36 on this page 12 is the Desplaines river. That is the same portion of the river which is indicated in the unplatted portion extending into the line on McCullough Exhibit 532 2. There are no differences in manner in which the river, and the section are platted north of that line, and what

they are south of that line, as they are indicated. In the way in which the sections are treated by the surveyor the difference is that in the meandered part the areas are given in different quarter sections.

In the meandered Section 1, the northwest quarter is marked 165 acres; the northeast quarter 87 acres on the east of the river, and 42 acres on the west of the river; the southwest quarter marked 160 acres; the southeast quarter east of the river 88 acres, southeast quarter west of the river 25 acres. The section and range number is Section 1, Township 38 North, Range 12, east of the third principal meridian. The total area of that section as given on 533 McCullough Exhibit 2, for the west half of the section west of the river 392 acres; for the east part east of the river 177 acres. The area of Section 36 upon the plat which I have produced, lying directly north of that Section 1 is marked 640 acres; and the area given on the Section 35 to the left and 36, into which the line representing the river extends are marked in full sections, 640 acres,—so all the way up the river to the sections next to the top line.

The last two rows of section are abbreviated.

The north tier of sections in the township are the fractional sections, where the deficiency of the surplus in the township are accounted for.

In that portion of the river up the river from Section 1, Town 38 North, Range 12 East, the bed of the river is taken into account in giving the acreage of the sections and quarter sections, while below that away down the river from that it is not so taken.

Thereupon counsel for complainant read in evidence the two following certificates upon said page 12, referred to by witness:

534 "Surveyor's office, St. Louis, 31st of August, 1837. The above plat of township 39, north of the division line of range 12, east of the third principal meridian, southeast of the old Indian boundary line is a correct copy of the plat thereof, on file in this office. Dan Dinclan."

Underneath that:—"Department of the Interior. General land office, Washington, D. C., Sept. 6, 1895. I hereby certify that this photo lithographic is a true and literal exemplification of the township plat of survey to which it purports to relate now on file in this office. E. F. Burt, Acting Commission."

MR. EMIL RUDOLPH further testified:

536 McCullough Exhibit 2 begins at the south line of Township 36, where McCullough Exhibit 1 left off. It goes on up through Townships 36, 37 and 38, up to the north line of Township 38 in Range 13, between 12 and 13.  
537 And the river crosses that line in Township 39, Range 12, on the line between 38 and 39 in Range 12.

Then McCullough Exhibit 1 and McCullough Exhibit 2 together exhibit the whole of the river Desplaines from the mouth running up toward the north line of Township 38, in Range 12 east.

With reference to Chicago that last point would be in what in the city is 39th street at its intersection with the Desplaines river,—that is, it is due west.

This McCullough Exhibit 2 goes right on across the portage, exhibiting Mud Lake, exhibiting the west fork of the south branch and the south branch of the Chicago river 538 to Lake Michigan.

Thereupon it was agreed that the label on the top of McCullough Exhibit 2 put there by the auditor together with the note, asterisk, “field notes of the meander survey show this point as the head of navigation, but the original plat shows no indication thereof,—on said exhibit should be struck off, together with the certificates, and the map admitted in evidence subject to the objection of the defendant that it was immaterial and irrelevant. Said map is shown in (Atlas, p. 3915).

MR. RUDOLPH further testifies:

McCullough 2-A begins where McCullough 1-A left off.  
543 McCullough 2-A goes on up through Townships 37 and 38 up to the line between 38 and 39, showing the river all the way with the same label and note, and then extending on through Ranges 13 and 14, shows Mud Lake, the west fork of the south branch, the south branch and the Chicago river to Lake Michigan.

Then they—the two sets, one and two on one hand and 1-A and 2-A on the other, together, show the same things.

Du Page creek or river extends through Section 17, Township 34, Range 9, but the acreage is shown as 640 acres, or a full section.

When you come over to Section 7 and 8 in Township 34, Range 9, which are the west tier of sections, the east quarters through which the river itself runs are indicated 544 with 160 acres, or a full quarter section. But the west quarter of those sections are fractional, because they are in the west tier of sections of the township.

Section 5 in 34, 9, is 640 acres. I examined the field notes at Springfield in this matter a good many of them, not all of them, and there are not any field notes of meanders for Du Page river or creek such as I have produced for the Desplaines river.

*Re-cross Examination.*

On that map over yonder the Chicago river runs off in a fork to the west. What that is known as I don't know, unless it is the west fork of the south branch. There appears to be another fork running south, that is known as the 545 South Fork of the South Branch. Bubbly creek runs 546 into it. That is not Healy's Slough. Healy's Slough would be in Section 29. It would be in the northeast quarter of Section 29 and 39.

In Rudolph Exhibit 1, I show a number of blocks in yellow, contractor's quarters, engineer's office, those were frame buildings of the—recently put up, apparently used in connection with this work.

547 I found a suspension bridge across the canal also. That appears to have been recently put up in connection with this work. My answer applies to all the yellow blocks, all the rectangles shown here. That is my autograph attached to the exhibit there. That is Mr. Bremer's autograph below mine. That autography in the practice as a surveyor goes as a certificate of the correctness of the plat.

Q. Do you understand that it has any higher weight than your sworn testimony on the stand as to the correctness of the plat?

A. I don't know. I guess it has about equal weight.



548 HERMAN H. BREMER, a witness for complainant, testified as follows:

*Direct Examination.*

My name is H. H. Bremer. My first name is Herman H.; residence, Chicago; occupation, surveyor. I have been engaged in business as a surveyor about 15 years. My experience consists in relocating lines, establishing original subdivision lines, in laying out cemeteries, and in locating rivers, ponds and lakes, railroad work and farm work.

In my work as a surveyor I have necessarily become acquainted or am familiar with the field notes, plats and maps and the practice of the United States Government surveyors in charge of land surveys in Illinois, made by and under the direction of the surveyor's general.

Referring to those field note exhibits, I have made use of those field notes in making a survey.

549 In making this particular survey, Section 25, I was associated with Mr. Rudolph, who has just left the stand,—in making a survey of Section 25, Township 34, Range 8 east of the third principal meridian. This plat called Rudolph Exhibit 1, is a correct representation of that survey. This line which is shown on this plat between the letters A and B is a series of courses run for the purposes of determining the meanders of the Desplaines and Illinois rivers. The notes and courses are a copy of the records as furnished by me, and purport to be copies of the original Government survey. That is I used these field notes which are in the field note exhibit and laid this line out from those field notes.

Looking at this map which is labeled McCullough Exhibit 1, the meander of the river is indicated on the exhibit, 550 by a single line on either side of the river demarcating the line between land and water.

I see that the scale of that map is indicated as 40 chains to an inch; that is the same as two inches to a mile.

The indication of the meander line on that plat, McCullough Exhibit 1, is the one customarily used by surveyors of the United States in platting public lands for sale when they plat them on a scale of that size. It is the customary method of indicating the meander line of the stream. That

scale is the customary size of Government plats of survey of vacant lands for sale which I have ever seen.

This map, Exhibit 1, which is before me, together with the field notes in filed note Exhibit 1, 2 and 3 of the survey of the meander line of the Desplaines river in Section 25, Township 34, Range 8, ascertain or make certain the location of the meander line of the Desplaines river in that section.

I could from the field notes which describe these meanders which appear in those exhibits and from this plat which is now before me find the meander line as located by them. These notes and plats make certain where the line is. I have by actual survey in the field from these notes located that line. It is correctly shown upon this plat, Rudolph Exhibit 1.

Taking the original Government field notes as a basis, I would say from actual survey that these lines had actually been run in the Government survey.

This map taken in connection with the field notes of the survey shows all that is placed on maps pertaining to the meander line according to the practice prevailing in the land office of the United States upon plats of public lands for sale made of that size.

We went down and made this survey between the 13th and the 20th of April, 1908.

552 As to the condition of the towpath bank between the canal and the Desplaines river along this strip here which extends up stream from the area enclosed with lines marked "coffer dam,"—I found that the towpath had been filled and also some stone taken and thrown along the side of the towpath widening the same. In other words the towpath had been graded.

The character of the stone which I saw used there was a poor grade of sandstone. It was perishable, of a perishable nature.

Q. I will ask you to state what the effect up that stone would be of causing a dam to be thrown across the river, a permanent dam at the point where the coffer dam is indicated, and a flowing of the water up against the towpath bank as graded and filled in the manner you have described.

553 Counsel for defendant objected to that as incompetent, immaterial and because there had been no foundation laid for it.

Whereupon after argument the court sustained the objection and ruled:

The COURT. You may go into the question of what has been done down there.

COUNSEL FOR DEFENDANT. I will modify the question.

Q. Just describe to the court the form of construction which you found existing on this towpath bank in this area where the towpath bank is indicated as being about 70 and less than 70 feet wide between the river on one side and the canal on the other.

COUNSEL FOR DEFENDANT. I object to that on the ground that it has not been shown by any evidence offered yet that that work has been completed at that point.

Thereupon the witness was asked the following question:

554 Q. Mr. Bremer, you may state what the effect of the creation of the pool by means of a fixed dam and power house built in the bed of the river across the Desplaines river near its mouth at the point where you have located the cofferdam would be, what the effect of this pool and of the waves and water and frost and storms and floods upon the pool as bounded by the towpath for the 1,500 to 2,000 feet north, upstream from the dam, would be?

COUNSEL FOR COMPLAINANT. Just a moment, Mr. Starr: I think you used the word "Pool" when you meant towpath bank in that question.

COUNSEL FOR COMPLAINANT. Yes.

COUNSEL FOR COMPLAINANT. What would be the effect upon the towpath bank, I think the question should be.

COUNSEL FOR COMPLAINANT. Yes,—what would be the effect on the towpath bank for 1,500 to 2,000 feet upstream, from the dam, of the erection of this dam and the creation of this pool under the action of the water, the elements, floods, storms and frost?

555 To which question the counsel for defendant objected and thereupon the court ruled as follows:

The COURT. Well, I will let you frame it yourself, but I will sustain the objection to the question as put because of the element not being present that the bank is to be protected in some way. I appreciate the force of what Mr. Reeves said yesterday, that they might spend ten million dollars, or whatever the sum named was, in building up a slope wall, a solid wall of concrete all along this whole place, and render it perfectly safe and that it would not be the thing that they

are going to do, or that they are required to do under their contract.

556 Thereupon counsel for defendant further objected on the ground that no foundation had been laid to show the witness' qualifications. Said objection was sustained and thereupon the witness testified as follows:

557 My experience in the matter of planning, respecting hydraulic work, dams and power houses, and so forth,—I have planned dams, at least two, and have made a study of hydraulics.

558

*Cross-Examination.*

I planned two dams, one of them has been erected at Neodesha, Nebraska, a dam about 12 feet in height and about 800 feet long. I was not in charge of the erection, I drew the plans for it. I did not superintend the erection and I was not present and did not observe it at any time after it was erected. I never superintended the erection of any dam. I never worked practically upon the erection of any dam. I

myself have observed on the ground the action of waters  
559 upon dams at different places,—at Joliet particularly, I

have seen the action of the water on the dam there, the bear trap dam, and at different places. The Joliet dam is built of concrete and there are no levees there to be washed at all. What I saw there was the water rushing on or over the concrete. As to the action of the water upon any earth levee, I could not find anything there to illustrate it from personal experience, nor anywhere, from personal experience.

Thereupon the court ruled that the witness was not qualified.

As to describing the condition of the towpath, I found  
560 the towpath had been filled about two feet above its normal level with a sandstone shale, for a distance varying between 1,000 and 1,200 feet, either way from the site of the Economy Company's plant, proposed plant. This sandstone, in my opinion, is not—

Thereupon counsel for defendant objected and counsel for complainant was directed by the court to ascertain if witness was qualified to state what he knows about stone.

COUNSEL FOR COMPLAINANT. Q. Do you know the character of sandstone in reference to durability, are you acquainted with it? Have you had experience in the observation and use of it?

A. I have.

Q. And the specification of it as a material.

A. I have had observation as to the use and durability and kind of sandstone which I saw on the sill of the towpath and also the use of it for building purposes.

Q. Well, what was the character of this?

561

*Cross-Examination.*

I did not say that I had any particular experience in specifying sandstone for buildings. I do pretend to have knowledge other than that which the ordinary individual having no special opportunities for observation or means of observation has of the character of stone. I acquired it by a study of geology. As to what are the various kinds of sandstone, I knew it in a general way from the study of geology, and to ask me to specify the different stratification is almost beyond me now. It is fifteen years since I have studied geology. As to setting myself up as an expert on sandstone, from remembering what I have studied,—I have seen this particular kind

of sandstone in different places, and this particular sand-  
562 stone interested me while on this work of surveying this particular section on account of the shale, and the nodules that are found in it. I have seen sandstone similar to it underlying the coal mines in LaSalle County, in the northern portion as I recollect near Oglesby, and it struck me that it was peculiar that that stone should be used—

COUNSEL FOR DEFENDANT. Now, I move to strike that out.

The WITNESS. This a general discussion.

The COURT. Yes, that may be stricken out.

Witness further testified:

I saw this stone that is placed on top of the towpath down at the site of this proposed dam. I know what the effect of the elements, air and water, would be upon that stone,—which last statement was objected to by counsel for defendant, and witness on cross-examination stated that he had observed the effect of the elements on stone of this char-  
562a actor very recently at the site of the proposed dam.

The standards to which I refer in my judgments on this stone is this stone itself in connection with stone of a similar kind, of similar appearance, which I have seen, on the mine dumps at Oglesby and Canley, Illinois; also at Bloomington

and Braidwood and Coal City, Wilmington and Sunflower,  
563 and I have observed it for a period varying from one  
day to probably two months. I had a special reason for  
examining it. It was not a part of my duty to examine it and  
study it. It was a matter of casual interest. I was studying  
geology at that time. I was continuing my prior studies. I  
was working in the coal mines at that time and had a  
564 good opportunity to study geology. I was studying geol-  
ogy seriously.

As to my meaning in saying that my study of geology  
was fifteen years back, as a part of my college course,—I  
meant to say that in my line of work a man never ceases to  
study. I have not made a serious study of geology since  
the day I left college.

Q. You have never observed the action of the elements  
upon stone laid or arranged as this stone is on this towpath,  
have you?

565 A. The stone is not laid.

The COURT. I am not going to accept testimony of this  
character.

*Cross-Examination.*

Turning to the map McCullough Exhibit 1, that map by it-  
self shows the meander line of the Desplaines river.

On being asked "Could you take that map by itself and  
run the meander lines of the Desplaines river?" the witness  
replied, "No, sir."

Q. Then the map by itself does not show?

A. It shows the meander of the river as I take it.

566 I cannot from this map trace the meander lines as laid  
down in the field notes of the Government survey. There  
is nothing on this map by itself from which I can run the  
567 meander lines of that river, because the field notes are an  
integral part of the survey and the map. They become  
a part of the map of necessity because the map was con-  
structed of the field notes. The map is certified to as being  
constructed from the field notes; not particularly this map,  
but a Government map. There is not anything on that map  
from which I could run the meander lines of the Desplaines  
river, as I claim they were under the Government survey.  
That map alone, would convey no knowledge to any person  
as to where those meander lines ran, and when I said that  
there is a thin line each side of the river on this map, McCul-

lough Exhibit 1, which shows the meander line, I refer  
568 simply to the line which marks the borders of the stream,  
the division between land and water, and that exists as  
well on unmeandered streams as on meandered streams, so  
that in that part of the Desplaines river there is nothing in  
the boundary itself different from the boundary of an un-  
meandered river, in this line dividing the water from the land  
that marks the meander. There is no other line which shows  
the meander line on that map. I testified that the meander  
was the dividing line between the water and the land. And  
the line that was run by the surveyor was simply a line that  
would in a general way define the sinuosity of the stream. I  
am using the term meander in a different sense from the term  
meander line. In my direct testimony when I said that this  
line marked the line between the land and the water, the  
meander line, I meant the meander. The meander line and  
meander are taken in a different sense in surveying work. I  
know of no map made by the United States Government on  
which the meander line is run and extended of the Desplaines  
river.

I stated on cross-examination that there was no map which  
would show the distance and courses as run by the surveyor,  
which would define that meander line on a map made on that  
scale.

It is true that in platting rivers under the survey by the  
general Government, that on maps of this scale where a river  
has been meandered, that the marginal line showing the river  
is regarded as the line representing the meander line, in a  
general way.

568

*Re-direct Examination.*

That means that in maps of this scale there is nothing  
showing the meander lines except the same sort of line that  
appears between water and land, whether the stream has been  
meandered or not. The stream itself as delineated, would  
give a general indication as to where it had been mean-  
569 dered by distances or courses. There is nothing on that  
map which shows where it has been delineated, but in a  
general way the map shows that the stream has been mean-  
dered by distances and courses, and these distances and  
courses were laid down on a paper and from that the meander  
line is shown, or the border lines of that stream as shown are  
traced.



I can tell from that map without the knowledge of the 570 field notes from the map alone, that that stream has been meandered, or some other stream on that map has not been meandered, by reference to the sections and the figures given in the sections.

The fact of the acreage given in the quarter section in place of the 160 acres indicates to my mind that that was derived from an actual meandering of the stream,—partially; but on a meandered stream the rules of survey state that the surveyor shall measure to the stream and shall there cease his measurements; and then measure from the north line of the township and this division on that map by distances measured north of the township lines and south from the township lines given, leaving in this particular instance the north tier of sections full with the exception of the west section of that north tier. In other words they measured up from the south and measured down from the north. The distances of those 571 lines are stated on that map, but not the meander lines.

And that is only done under Government rules where the river is one which has been meandered.

*Re-cross Examination.*

573 This surveying of the meander, whenever it was done or whatever was done, was done in consecutive order, practically at the same time, as a part of the same work. There is nothing on that map that would tell you if you were buying property bordering on the river where the meander line as to that particular property ran, nothing that would show its courses and distances.

574 EDGAR WILLIAMS, a witness for complainant, testified as follows:

*Direct Examination.*

My name is Edgar Williams, my business, civil engineer. I am on my own work a good deal of the time, and a great deal of the time with Mr. Cooley assisting on his work. I have been acquainted and working under Mr. Cooley twenty years. I was under him in the employ of the Sanitary District of Chicago as engineer.

On the map marked McCullough Exhibits 2-A, I made these inscriptions and marks and representations; beginning down here at the lower left hand corner in Section 25, Township 37, Range 10 E., there was a the word Romeo. I wrote that there and also the following. Goose Lake, the boundary of the Village of Emmetsburg, and its name, nothing else. Also the Keepotaw, an old subdivision of Lemont, the name of Lemont, and the name of the subdivision of Keepotaw, the sub of the southwest fraction of the west half of the southeast quarter of the south fraction of the northeast quarter of Section 20 and the color which indicates it. Then next, two weeks ago—I had better take these others first. Near the Sag, I put on the “Archer,” and the “Pearson” additions to Desplaines, and its red color, and nothing else. I put on the name of Sag, and the Archer and Pearson additions. The name of Sag at that last place. At Willow Springs I put on the name of Willow Springs and of Spring Forest. At Summit I put on the name of Summit and the boundary and the red color. I put on the name of Lyons and of Riverside; put on the name of Bridgeport; the approximate location of Marquette’s cabin, 1674 to 1675, and the house. The name of Bridgeport. I put on the coloring which marks the odd numbered sections along the river, Section 1, Section 11, Section 15, Section 25, Section 33, Section 5, Section 7, Section 1, Section 11, Section 15, Section 21, Section 19, Section 25, Section 35. That is to represent the sections of the canal lands on that McCullough Exhibit 2-A. I put on the borings in red, 46, 49, 47, 48, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, and 60. I took the location of those from the Marshall report of those borings.

I don’t see anything else from these colored town sites that I have indicated. I had the certified copies of the plats before me when I put those on. They are correctly located.

These several geographical locations are correctly placed, except I put on this, Mr. Cooley’s location of Marquette’s cabin. My information on that was obtained exclusively from Mr. Cooley.

On McCullough Exhibit 1-A, I placed upon that map beginning at the top where it connects with the other, the boundary of west lot 4 and its name, and the color, red color. The boundary of lot 4 and its name, and the color. The location and the name of the penitentiary. The location of the Sanitary District gauge, and its name.

In Section 9 the location of the Economy Light & Power gauge and its name, at Dam No. 1. Then the name of Dam No. 1, and the location of the dam. The gauge No. 1 of the survey of 1883, the name and the location. The name and the location of the Jefferson street bridge. The name, color and boundary of the west Juliet subdivision or plat. The name, color and location and boundary of Juliet.

The name, boundary and location of the School Section Addition to the Town of Juliet on the west side of the river, and the name, boundary and color of the School Section Addition to Juliet on the east side of the river.

The name, boundary and color of the subdivision of Block 96 of the School Section Addition to Juliet.

The name and location of Gauge No. 4 of the survey of 1883.

The name and location of Haven's Dam.

The name and location of Brandon bridge.

The name, boundary and color of the Buffalo addition to the Buffalo plat.

The name, color and boundary of the Vienna plat.

The name of Lake Joliet. The name and location of gauge No. 3 of the survey of 1883.

The name of Treat's Island.

The name of Millsdale and the location.

The name and location of gauge No. 4 of the survey of 1883.

The name and location of the Sanitary District gauge under Smith's bridge.

The name and location of the United States gauge near Smith's bridge.

The name and location of Smith's bridge.

The name of Lake DuPage.

The name and location of the Sanitary District gauge a mile below the Smith bridge.

579 The name and location of the Sanitary District gauge a mile and half above the Kankakee river on the Desplaines river.

The name and location of the Sanitary District gauge half a mile above the Kankakee river on the Desplaines river.

The name, color and location of gauge No. 5 of the survey of 1883, a quarter of a mile above the Kankakee river on the Desplaines river.

The name and boundary of the plat and location of Beard's Part and the Handy Part of the Town of Kankakee.

The name and location of the Sanitary District gauge and

of the United States gauge in Section 27, Town 34 North, Range 8 East, two and a half miles below the Kankakee river.

Then I colored the canal lands in Town 36 North, Range 10 East, Section 3, Section 15, Section 27. In Town 35 North, Range 10 East, I colored canal lands, Section 3, Section 9.

I also wrote—put on the name of Joliet in that Section 9.

I colored Section 21, Section 19, Section 29 and 31, all in Town 35 North, Range 10 East.

In 35 North, Range 9 East, I colored Section 25, Section 35, Section 14, Section 11, Section 15, Section 21, Section 29, and Section 31; all in Town 34 North, Range 9 East.

580 In Town 34 North, Range 8 East I colored Section 25, all canal lands.

There is not anything else that I put on there on either of them. But for what I have enumerated McCullough Exhibit 2 and McCullough Exhibit 2-A are in the condition in which they came to me.

And thereupon it was agreed by counsel as follows:

It is conceded that McCullough Exhibit No. 2-A, which is the sheet counsel for complainant now holds, is the same as McCullough Exhibit 2, in so far as counsel for the defendants now know or believe; but they reserve the right to examine and verify it, and it may be considered as a duplicate unless they raise objection hereafter.

581 Counsel for defendant thereupon reserved their objection that there is no plat of this nature at Springfield, and further that the note "field-notes on the meander survey shows this point as head of navigation, but original plat shows no indication thereon, did not appear on the original at all.

582 Thereupon the court held that the same ruling would apply to Exhibit 2-A as previously applied to McCullough Exhibit 2, and the said note would be omitted, together with the note "location of Marquette's cabin."

583 And thereupon the balance of the map was admitted in evidence. (Atlas, p. 3916.)

586

*Cross-Examination.*

Q. Mr. Williams, did you locate the situation of these various gauges and bridges, and so on by yourself?

A. I did.

Q. There are some eleven passenger bridges and two rail-

road bridges over the river in the part shown by map, McCullough Exhibit A-1?

A. Yes.

COUNSEL FOR COMPLAINANT. I object to that, if your Honor please. Just a minute; I am not sure whether I understand Mr. Scott's question, whether he means to say—to ask the witness to count up the bridges which he has put here, and give the total of them, or whether he means that this existing situation is the situation in that territory at this time in fact. I do not know which the counsel means.

COUNSEL FOR DEFENDANT. Mr. Williams answered the question. What did you understand me to mean, Mr. Williams?

COUNSEL FOR COMPLAINANT. Read the question.

(Question read.)

COUNSEL FOR COMPLAINANT. Wait a minute, before that question is answered I want to know—

The COURT. It has been answered, so it is proper not to ask what he understood, so long as it has been answered.

587 COUNSEL FOR COMPLAINANT. But before it goes any further I wish to interpose the objection now, if it means what in fact exists in this territory at this time, I object to it, because that is no part of the matter which was dealt with. The fact is, there were certain specific objects that had appeared in evidence in various ways which it seemed desirable to counsel for the State to have delineated and illustrated, so that the evidence would be illustrative, and we got this witness to make the illustrations. Now, if counsel is asking him whether there are not some other things that are not illustrated, I say it is not cross-examination of this witness now, and I object to the answer, and move that it be stricken out.

COUNSEL FOR DEFENDANT. As to that, it is quite important that an illustration shall illustrate the general subject matter it is intended to illustrate. Now, while it is true that there was evidence showing two bridges which appear here, there was also evidence showing eleven more bridges which do not appear here. While it is true that there was a dam shown here, it is also true that there were several more dams shown by the evidence at the time this was made. Now, I simply do not want any confusion on the part of the court, and I am asking the man who made this and located these obstructions, whether there were or not more of the same character  
588 that do not appear on the map.

A. There were more bridges than are shown here. I only show those few bridges at Joliet and the Smith bridge.

We show Haven's Dam here, but as I understand that isn't in the river now. Dam No. 1. There is Dam No. 1.

Q. Well, you say Haven's Dam is not in the river. How many other dams were there not in the river at the time you made this that you did not show?

COUNSEL FOR COMPLAINANT. I object to that, if your honor please. Please repeat the question?

(Question read by the stenographer.)

589 COUNSEL FOR COMPLAINANT. I submit, if your honor please, it is not part of the proper cross-examination of a witness who comes here as an engineer to explain a draft or plat, which he has made, to ask him how many other things at any other time there has been that he has not shown. It is certainly not proper cross-examination.

The COURT. I should rather think that the cross-examination should be confined to getting at the purposes and the reasons why he showed it. If he did it simply because he was instructed to do it, why that ends it, so far as he is concerned.

COUNSEL FOR DEFENDANT. Well, it is the map or plat that is the significant thing, and not the witness, and when they put in a map it either ought to show the thing as it is or we ought to be permitted, it seems to me, to have the man who made it show that it does not show the thing itself.

The COURT. Yes, you may do it by showing how he came to put in certain things and why he omitted other things, and if it is simply because he put in the things he was instructed to put in, why, then you have got to go further with somebody else, not with him.

COUNSEL FOR DEFENDANT. First, I must establish that there were things he did not put in before I ask him why he did not put them in.

The COURT. Yes, but in a general way, not as to the details.

In addition to Haven's Dam, that I did not put on this  
590 plat, I think there was a dam at Treat's Island on the north side. I have never been down to Treat's Island, and what I know of it comes wholly from maps and profiles. I put on the work that I was directed to put on. I had recourse to the profile of 1866 and 1867 to get this location. I have seen the profile, United States Government survey  
591 profile of 1867. I have worked on it in connection with this river a little.

Q. Didn't that show you a dam about where the Economy Dam is now being built?

A. I think it does.

COUNSEL FOR COMPLAINANT. I object to this as not the best evidence.

The COURT. He may answer.

594 COUNSEL FOR DEFENDANT. He has answered that he thinks it does. Were you instructed not to show them upon this map?

A. I had no instructions at all about that.

Q. No instructions as to it?

A. No, sir.

Q. Were your instructions simply that you should show the bridges that you do show specifically?

A. Yes, they gave a list and I put them on according to the list.

Q. They gave you a list of the things that they wished you to show on the map and you put them on?

A. That is two or three times, the first list did not  
595 cover all; they first wanted some things put on and then others.

Q. You were instructed to show and did not attempt to show the various structures of the same kind that appeared all the way down the river?

COUNSEL FOR COMPLAINANT. I object.

COUNSEL FOR DEFENDANT. As, for instance, you did not attempt to show all the bridges or all the dams that had or did exist?

The COURT. Read that question.

(Question read by the stenographer.)

COUNSEL FOR COMPLAINANT. I object to that, your honor.

A. No.

COUNSEL FOR COMPLAINANT. I submit, your honor, please, there is nothing intended there but an argument.

The COURT. I think he is entitled to the benefit of the argument.

Thereupon the said maps marked respectively McCul-  
596 lough Exhibit 1 and 1-A and McCullough Exhibit 2 and  
2-A were then received in evidence. (McCullough Exhibit  
1, Atlas p. 3913.)



597 HON. S. R. VAN SANT, a witness for complainant, testified as follows:

*Direct Examination.*

My name is S. R. Van Sant; I live at Minneapolis, Minnesota. That has been my home about two years; have lived in Minnesota 25 years. I was Governor of Minnesota at one time. I was first elected in 1900 and served in 1901 to 1905, the second time.

My home before I went to Minnesota was Davenport, Iowa, and Rock Island, Illinois. I am in the transportation business, principally on the Mississippi river. I have been in business connected with the navigation of the Mississippi river, actively and as an owner of steamboats since 1870. 598 Before that I was employed in a boat yard, building and repairing steamboats, and as a caulker on steamboats, at LeClaire, Iowa. It was formerly at Rock Island, Illinois, and was moved from Rock Island to LeClaire.

My father was in the business of manufacturing and repairing steamboats there for many, many years.

I have been licensed as a pilot and master upon the Mississippi river by the Federal Government. My first trips on the river were in 1857, when quite a small boy. I have been engaged continuously in the business of piloting, handling and operating steamboats upon the Mississippi river, or in the business of manufacturing and repairing steamboats continuously from that time up until the present. I was in the Civil War, of course, but I worked in the boat yard as a boy, with my father. Of course, I discontinued working while I was in the army. Barring the time I was in the Civil 599 war, 1861 to 1865, my life has been connected with navigation upon the Mississippi river continuously from 1857.

I am connected with a navigation company at this time, the Van Sant Navigation Company, and with the Carnival City Packet Company. Those companies own and operate ten steamboats on the Mississippi river at this time. In the course of my life on the river my companies have owned, I should say, thirty to forty boats.

I have made the trip on the Mississippi river, the Upper Mississippi, in the course of my business and duties which

I have described,—well that would be hard to tell exactly,—I suppose at least five hundred or a thousand trips. These steamboats on the Mississippi river make a dozen or more trips a season; quite frequently as many as twenty trips a season, 25 in some cases.

600 The trip would usually commence at LaCross, the rafting works. West Newton and the mouth of the Chippewa, Reeds Landing and Stillwater and Prescott. These boats that I am speaking of are tow boats, and they would go to all points on the river above St. Louis and to St. Louis occasionally. Those were Minnesota and Wisconsin points where we got our tows. The boats I was operating upon as pilot and master were engaged in the carrying of freight and passengers upon the river, in some instances, but not very much. They were mostly towboats, but we have carried excursions with them, and carried freight in some instances. But the principal business of the boats I personally operated on was towing, of course, and bringing lumber down the river to the points mentioned.

The boats that belonged to the companies with which I am connected were engaged in the business of transporting freight and passengers, and are.

In the early days they did not tow rafts by means of steamboats, they floated them with sweeps, with men on the cars. Sweeps are large paddles with an oar stem, a long stick you might call it, a stick of timber with an oar placed on, and they are hung on a pivot on the bow and stern of the raft, and the rafts are steered with these sweeps or oars. To operate those sweeps would require the efforts of twenty-five men, 12 or 14 at each end. It mainly depends upon the size of the raft. They were used principally in steering. These lumber rafts were largely put up in what we call cribs, tiered one course above the other, usually ten feet wide and thirty-two feet long. These were put in the rafts. Courses of plank timber or boats,—suppose you had a raft of ten courses, that would mean ten inches. Each course was called an inch. Twelve courses would be twelve inches deep. Six one inch—the boats would be equal to six inches of timber. Six inches of timber would be called six inches deep. And to make a 12-course raft then, if it was made of two-inch plank it would be only six layers of plank, but it would be called a 12-course raft.

The business of towing rafts by means of steamboats first came in on the Mississippi river about 1866 to 1867. It came

about—I don't know, because during the Civil War when men were so scarce, for they were in the army, they got a small class of boats and used the men only on the stern. They did not keep the men on the bow. I did in our boat yard manufacture boats for that service and install them in service in the '60s,—in 1869.

The first boat that I remember was a boat called the James Lyon. That was in 1857. Well, as I remember, she was a boat 160 to 170 feet long, and with a 32 or 36-foot beam. Her draft line would be about 26 to 30 inches. When I was on her she was engaged in taking corn in sacks from Fulton, a point on that river reached by rail to Minneapolis and St. Paul. 601 That was the customary form of traffic on the river at that time.

From Rock Island, where the boat yard was, up to the Minnesota points I have named, during the winter months we stopped navigation about the 15th of November and commenced again about the 1st of April. Then in certain seasons when the water was low, boats of heavy draft could not run. It would be perhaps two months, quite frequently, that navigation would be suspended. I am speaking of before the river was improved. It would be two or three months. It depends on the stage of the river. In some seasons it would be more, and in some less.

December, January, February, March,—and one-half of November, that is four and a half months that they would go out for the winter, and two months for low water in the summer, that would be six and a half months that there would be no navigation and five and a half when there would be navigation, when the low water interruption would be two months. The winter months we couldn't run at all, and quite frequently in those years during the season of low water it was impossible to navigate on account of bars and rapids and other obstructions when the water was low. The period, then, of actual navigation, taking the years as they run on an average, would be five or six, and in some cases seven months, not to exceed that.

The season of low water when the larger boats could not make the through trip, I would say, would be a couple of 602 months, it depends. Some seasons we would have a rainy, wet season, and they would run more. It is a question of the draft of the boats and the stage of water in the river. It is wholly governed by that. It may be more and may be less.

I have seen it more. In 1864 we couldn't run at all. That was known as the "Low Water Season." Navigation was practically suspended except for very light draft rafts and light draft crafts, practically the whole season.

The little boats could run from intermediate points, but what we called the big boats were through boats from St. Louis to St. Paul. And, let me state, too, if I may be permitted to do so; that at certain parts of the river the water would be lower than at others. That is, there would be more obstruction. For instance, the upper river would be low and some of the big boats would go up to certain points, and the little boats would then take their passengers and freight on above. That was quite a common occurrence.

Quite frequently the boats would go to Hastings, Min-603 nesota. The river from Hastings up was a very bad piece of river. The water was low and the big boats could not go all the way and they would connect with the smaller boats, and still that would make the through trip. They would take passengers and freight up to St. Paul and then bring passengers and freight back to St. Louis. Hastings from St. Paul is thirty miles; LaCrosse from St. Louis, is—well, I can't tell exactly,—I think about 600 miles.

We had a boat in that business taking a transshipment from a large boat at Hastings and carrying it to St. Paul. It was called the "Cheever." It was a light boat, built purposely for low water navigation, very wide and with light power, in order to make her light draft. The draft of the "Cheever" was, oh, I should judge not to exceed 16 to 18 inches, empty.

604 A sternwheel boat, about which there was some discussion a moment ago,—always draws more at the stern than the bow, for the reason that the stern is built out beyond the bearing-up capacity of the hull. That makes it heavier at the stern and light at the bow, and frequently we would put 20 or 30 tons on the boat, and she would draw no more than when empty. That was true of the "Cheever." She would carry her fuel and passengers and likely a few tons of freight, on 18 inches of water. That was a sternwheel boat, and the bottom was flat. Her draft at the bow was less than at the stern.

The "Phil Sheckel," that used to be on the upper river, I remember her very well. The "Phil Sheckel" was 110 feet long with a 26 foot beam. Her draft wasn't over 14 or 15

inches of water, a sternwheeler. That boat was built to run up the Chippewa river. That was a very scanty stream of water. The water was very scanty, and she was built in connection with a lumber company to run up to LeClaire, and up to points on the Chippewa river to carry up men who floated the rafts down and the freight, kitchen, and so forth, and the men lived on the boat, and when they brought the raft down she took them back. They find 14 inches of water on the Chippewa, at certain stages of the year. Sometimes it would get so low that that boat could not run, because the river would pretty near go dry. But when there was a great rise on the river, sometimes five hundred million feet of lumber would come down that river in a year. They would sometimes have to wait with their lumber until a freshet or the rain came, and then they would go down to the Mississippi. I would just say I am familiar with this boat and I give the details because I afterwards owned her. We used her for several years on the Mississippi. In the towing of these

605 rafts we used her as what you would call a bowboat. A bowboat is put right across the bow of the raft, and she steers or directs the bow of the raft, and now instead of taking one raft we take two down the river, and this boat was used for that purpose. The big boat was behind and was the propelling power, but this bowboat was the steering boat and kept the raft off of islands and obstructions. It pointed the course. We used the "Sheckel" on the Mississippi river about four or five years. We sold her and she is now at Miami, Florida, engaged in the building of the railroad from Miami to the Keys. She went there with her own power. She crossed the Gulf and went there in safety,—down the Mississippi and into the Gulf, and 1,200 miles out into the ocean, the bay.

I remember a boat called the "Jeannette Robar," and I think there was a boat—I know more about the "Jeannette Robar," my father built her. It was a very light draft boat. She was built to run up the Minnesota river in her early days. She was about 150 feet long and 30 feet beam. Her draft was 18 to 20 inches; she was a very light draft boat. That boat was engaged in the transportation of freight on the Minnesota.

The condition of water on the Minnesota river differed, but it was very desirable in those days to have light draft boats that would navigate as long as they possibly could. This boat was built especially for that trade.

It was customary in the boat yards in the Mississippi in the periods when I was maintaining a boat yard, to build 606 boats that were especially adapted for these shallow tributaries. They did carry on successful commerce on them.

The "Des Moines Valley" I think was built at Rock Island. I remember of seeing the boat and know of her. She was on the Des Moines river in the early days. I am not very well acquainted with the Des Moines river.

I remember the "Black Hawk" very well. My father built the first "Black Hawk." She was a little boat built purposely to run up the Rock river, a light draft and small craft to run up the Rock river. She was 100 feet long, breadth twenty-two feet, draft about sixteen inches, a very light boat. There used to be draw-bridges on Rock river at that time. I should think she would carry 40 or 50 tons. She was a small boat.

607 I remember the "Enterprise" very well. She operated at one time. She was first operated on the Mississippi river below St. Paul, but she was afterwards taken around the Falls by land and operated above Minneapolis. They took her around on wheels, skids, blocks and tackle. They had to go seven miles by land with her. I mean, she navigated on the Mississippi above the Falls of St. Anthony. She was a very light draft boat. I don't remember her exact size, but I remember her as a very light draft boat, in the same class of boats as the "Cheever," if not lighter.

They used to be a type of craft used on the Mississippi called "wood boats." Those wood boats were flat-bottom boats with scow bows, made very light to go up the creeks and rivers and get wood and bring it out into the Mississippi, and propelled with poles. They are in use some yet.

I remember a boat called the "Silas Wright," very well. That boat was used on the Chippewa. The "Silas Wright" was built to operate on the Chippewa river, but they found that she was too heavy draft and so they built two hulls, put one on each side of her and rigidly fastened them to the boat to bring her up, and she successfully navigated the river there for years; at a depth of 12 or 14 or 16 inches of water, although she was originally built for a draft of 18 or 20 inches of water.

I remember the "Lady Van Sant." She is a light draft boat, 105 feet long and 24 feet wide; draft I would say 608 20 inches. She was what you would call a bowboat.

I remember the "Harriet." Her draft was not over 18

inches. She was in the same business, only she was two feet wider than the other boat; and was used on the Mississippi and these other tributaries where the rafts came from.

The "Keokuk," we just built her last year. She made her first trip this spring. That boat is 140 feet long and has a 30-foot beam. She draws, trimmed up, I would say 26 inches. I mean by trimmed up, carrying 20 tons. She would carry 20 tons on that depth.

As to the currents, the varying currents were, which I encountered on the Mississippi river,—well, there are places where it is much swifter than others. The Moline chain is on the Upper Rapids. We have very swift water on the Lower Rapids; but the swiftest water I know of is on the Moline Chain.

*Cross-Examination.*

As to being able to say what the velocity of these currents are, or of these rapids, without having measured them, 609 I think I would be a moderately fair judge. I have navigated them with others, and lived practically in the engineers office.

I never measured the current at any point. I am able to estimate the rapidity of the current by comparing it with other points. I stated the swiftest place on the river; I can judge that, can't I. As to how many miles per hour water runs at any particular place,—that would be more sometimes than at others. It would be more when the water is highest. There would be a greater volume to come down through the chain.

The COURT. The point is, how can you determine, Governor, unless you were an engineer and measured those things, what the actual velocity is?

A. I cannot accurately. I said I cannot.

Q. Even fairly accurately?

A. I could only judge by what our boats—the usual time they would make up stream, and the time they make going up stream in this swift current. I can estimate in that way how much, perhaps, it is swifter than at other points on the river.

COUNSEL FOR COMPLAINANT. I think if we have the geography, if a man knows the number of miles he is going to make and knows the number of hours it takes to make the trip, and then compares the velocities that he encounters on his way, those that are swifter and those that are slower, he



would have a standard by which, from long use, he could form a judgment.

The COURT. I don't think, for the purposes of a case like this, that that would be proper.

*Van Sant,—Direct Exam.—Continued.*

610 There has considerable work gone on in improving the Moline Chain. That work was instituted and carried on by the Government. I would just state now that they have built a canal so that we avoid going up stream through this swift water.

With the work of making some of these improvements,—our boats were engaged with the contractors, chartered to them, and were on that work almost constantly. The Government's engineer's office by which that work was carried on was at Rock Island; our office at that time was at LeClaire, just at the head of the Rapids, and this was the foot of the Rapids. The Rapids were about eighteen miles long, and we had a boatyard there at one end, and the Government office at the other. I was very familiar with it because we built their boats, their chisel-boats, built their dredge-boats, and chartered them steamboats, and was in constant communication with them.

Q. State whether or not in the requirements as communicated to you by Government engineers for the purpose of getting boats that would perform this work, the velocities were stated to you by the Government engineers.

COUNSEL FOR DEFENDANT. That is objected to.

The COURT. Sustained.

The WITNESS. Before these improvements were made, navigation was actually carried on up stream against this swift current. In certain stages of water, certain boats would have to warp over the chain, especially Moline Chain.

611 A boat would come up in to the chain in the swift water as fast as she could, she would be either anchored there or hold herself there with her prow, and they would put a coil of line and an anchor out in a yawl. They would go to the side where the current was not so swift and the would be water enough for the yawl or boat, and they would go up to this point and cast their anchor and drift right down to the line, as it is a very easy matter, and then they would put a line on the steam capstan and wind up the line, after the anchor was laid. That was a common practice in passing Moline Chains.

They used it until the Rapids were improved; well, from the time of the earliest navigation until say, 1868-9 or '70, when the first improvement in the channel was made.

COUNSEL FOR COMPLAINANT. Now, I will ask you, Governor, to take the case of a river, which for a period of three or five months each year, exclusive of the time it was frozen over and exclusive of the time of extreme low water, presenting a depth, which would range from fifteen inches to ten feet and upwards of water, and in a channel, which would range from 250 feet wide to a quarter of a mile wide, and which had a current which varied from almost an imperceptible current in some of the wide spots where it was a quarter of a mile wide and ten feet deep, to a current much of the way two and a half miles an hour, one or two places three and a half, one or two places five miles an hour, and one or two places seven and seven and a half miles an hour, the swiftest current in one place being in the shallow part, and in another instance where the water was somewhat deeper; a stream which had such course of sinuosities as appear on this McCullough Exhibit 1A, this map which is before you. It is the one that is marked McCullough 1A, and shows the course of the river from Lockport, Joliet, down to the mouth of the River Desplaines. That is a map that is drawn on a scale of two inches to the mile. I will ask you to state whether, in your judgment as a practical navigator, a stream possessing those qualifications would be a navigable stream.

612 COUNSEL FOR DEFENDANT. That is objected to. In the first place, the curves are a very important feature. It is impossible that a witness can know from a map two inches to a mile what the curves of the stream were. The general pronounced bends of the stream would be shown, but the curve from point to point would not be shown. It is objected to again because to state that it has certain spaces of practically a level character, no slope, and certain others with a fall of so much, without indicating within what limits that fall comes, and what the extent of the level is, gives no indication, it does not describe the river as the evidence shows it in this case, and from such a hypothetical question, no such judgment or knowledge of the river can be given to the witness that he can form a judgment on it. Secondly, that it assumes the widths of channels that have not been proved in this case. There are no such channels at the declivities and slopes as have been assumed in this question and they are not proved

in the case. Now, to say that the river has in some places no slope and in some other places a slope of so many feet to the mile—it may be twenty miles of slope and one mile of level. I submit the whole question is not one upon which an intelligent answer can be made.

COUNSEL FOR COMPLAINANT. If every word that counsel has stated is true, which we deny, but if every word of it was true, the question is proper as a hypothetical question. We have a right to show what it was.

The COURT. Read the question, please.

(Question read by reporter.)

COUNSEL FOR COMPLAINANT. I will add to that that in one place about a mile, where there is an island in the stream, the channel narrows up to one hundred feet and part of that narrow channel along the island narrows down to a little less than one hundred feet about sixty feet wide.

COUNSEL FOR DEFENDANT. There is one other objection that I wish to make in addition to this made by Mr. Scott, that is, that the answer calls for a conclusion upon the word "navigable." The question should be, whether the river in his judgment was capable of carrying commerce for useful purposes, whether boats could be taken up and down the river. We don't know what the witness understands by the word "navigable."

COUNSEL FOR COMPLAINANT. I will accept the last suggestion to the question and put it up a stream answering 613 these qualifications, if it would be such that boats carrying freight would be capable of being operated up and down the river.

The COURT. For commercial purposes?

COUNSEL FOR COMPLAINANT. For commercial purposes.

COUNSEL FOR DEFENDANT. The question is still objected to.

The COURT. Governor, do you believe you have sufficient data to give an intelligent answer to that question?

A. I think I have.

The COURT. You may answer it.

A. In my judgment it could.

COUNSEL FOR COMPLAINANT. Then I will ask the further question separately, in your judgment would or would not the stream possessing these qualifications be a navigable stream?

COUNSEL FOR DEFENDANT. That is objected to.

The COURT. I sustain that objection.

*Cross-Examination.*

616 I worked in the boat yard when I was 13 or 14 years old.

That would be about the year 1856. I began to run on the river as a business as a boy. Those boats that I have testified about and give their draft, were usually light draft. A boat like the "Phil Sheckel," 110 feet long, could carry a certain number of tons without adding very much to her draft. The capacity of the "Sheckel" in tonnage, freight tonnage, I don't know; don't remember. Her draft when loaded to her capacity would be three feet and a half. That would be usually true of all those boats, those smaller boats I have mentioned. They are generally about four feet depth of hull, and you can load them down to six inches of the guards. It is a fact, that the effort was to build boats adapted to the small streams, so as to make them available for commerce, and wherever there was a river that could be used for commerce in some way or other, they built a boat to navigate it. In those early days they resorted to the rivers as a matter of course, if the river could be used, and they build some kind of a boat, if one were possible, to navigate every stream where commerce can be carried on.

These rapids at Rock Island, Moline—sometimes called Rock Island, I notice, and sometimes Moline by Mr. Starr or by me, and sometimes the Le Claire Rapids, I think they

617 are laid down in the Government report as Rock Island

Rapids, extending from Le Claire to Rock Island, about fourteen and a half miles, and the fall in that distance is about I think twenty feet; I didn't measure this; that would be a fall of about 18 inches to the mile. I know of Major Ruffner, but I never was acquainted with him, and he wasn't there when I was about the Rapids.

It is always dangerous to pass the Rock Island Rapids. This improvement I spoke of I think was taken up about 1868 or '69. I don't remember whether the first work was done in 1852; it might have been. I know they were very difficult of navigation before any work was done on them, because we repaired the steamboats damaged on the rapids; 618 it was quite a frequent thing to have to repair steamboats.

The Mississippi river was nearly half a mile wide, I should say about that. Some places it was much narrower and some places a little wider. At Moline Chain it would not be

a quarter of a mile wide. That is Moline Chain, which is now shut off by the dams. When we are passing the rapid places like that in the river, we have to follow the channel; the channel there is quite narrow, but deep. The channel at the narrowest point is I think 200 feet wide. That has been excavated by the Government by mean of cofferdams.

As a navigator, without knowing the width of the channel where I was to determine whether it was navigable or not, and at the place where the velocity was the greatest, without knowing the width of the channel but knowing the velocity, I would be able to state whether or not the river at that point was navigable. If I know the depth of the water in warping, I would carry the cable and the anchor, a thousand or 1,200 feet. It depends on the length of the line, carrying it 619 along the side of the channel where it was not so swift.

The movement of the boat during the warping is as follows: They steer the boat just the same. They use her wheels but this helps the boat over. Her power does not quite overcome the current and they pull her up with the anchor. They usually try to get the anchor above the chain. If not, they lay it twice. They are supposed to pull in the channel. When I say such a river as described in the hypothetical question used by Mr. Starr, can be used for boats, I refer to light draft boats, I should judge 125 to thirty or forty feet in length. For useful commerce, the dimension of a boat would depend upon the commerce and the nature of the stream. If you want to build a boat of sufficient light draft to navigate the river to make it profitable, I say a boat without a cabin and a very little upper works, built with very light draft from the very start, you can make her so that she will draw not to exceed, say, about twelve inches of water; about one hundred and forty feet long; thirty feet wide, 26 to 30.

Q. Now, governor, will you please consider a river of the description which I will now state and tell me whether you think such a boat as you described could be successfully navigated on it; beginning at a point sixteen miles from its mouth. We are now coming down to the mouth on this part, and are going to consider whether it is navigable or not. No, we will begin higher up. We will begin at a point 20 miles from 620 its mouth; and in the first four and a half miles a fall of 42½ feet, in the next 5,500 feet a fall of nine feet; that is to say, one and eight-tenths feet per thousand; then the natural channel there being less than 100 feet in width in places; the

next stretch being 2,000 feet with a fall of 3.75 feet, there then being a level of  $4\frac{1}{2}$  miles, then a sharp curve and a fall of 5.5 feet in 2,000 feet and a channel 60 feet wide.

A. How deep?

Q. About 15 inches deep? I say channel 60 feet wide, I mean the entire river.

A. The whole water of the river goes through there.

Q. Fifteen inches deep, and as described in the evidence in this case, boulders protruding above the surface?

A. Yes, sir.

Q. Then a distance of two miles of comparatively level water, and then a fall of 3.2 feet in 2,000 feet, being 1.6 per 1,000 feet. Now, I will ask you to state whether a river of that description, without improvement of the channel, could be navigated for the purposes of useful commerce.

COUNSEL FOR COMPLAINANT. I object to that, if the court please.

THE COURT. He may answer.

THE WITNESS. You will have to state that question again. (Question read by the reporter.)

Q. Before you answer the question, assume wherever I have said "channel," that I mean the width of the river, and not the width of the channel?

A. Now, let me ask a question. You say whether the river is narrowed up to 60 feet there are boulders protruding?

Q. Yes, sir?

A. How close together or how many boulders are there?

Q. They are so close together, according to the evidence here, that a canoe has to dodge to get through them.

COUNSEL FOR COMPLAINANT. There is nothing in this case on either side, in my judgment, to hypothecate that question on, but I will not object.

THE COURT. I cannot judge what the defendant's case is going to be, but they have a right to put your hypothetical questions.

COUNSEL FOR DEFENDANT. But, your Honor has a good memory and Mr. Clements, their witness, last night testified as to boulders.

621 COUNSEL FOR COMPLAINANT. Not in the way you say.

THE WITNESS. Now, I want to be right on this. Now, what is the fall in the first 5,500 feet?

COUNSEL FOR DEFENDANT. That is not first, but in 5,500 feet the fall is nine feet.

THE WITNESS. What is the first 42 feet?

COUNSEL FOR DEFENDANT. That is a fall of  $42\frac{1}{2}$  feet in five miles, a little less than five miles, as a matter of fact.

A. Well, if that stream where the 60-foot channel is—

Q. 60-foot river.

A. Sixty-foot river has boulders sticking up, so that a canoe only can dodge them, why, it could not be navigable. I would say that in my judgment. That is answering the question on those suppositions. That is the point right there. If those boulders are sticking up there, so that it takes a canoe to dodge them, it would not be navigable for a steamboat. That is distinctly understood.

COUNSEL FOR DEFENDANT. Assuming now, for the purposes of this question, that the boulders were not there, and that it was sixty feet wide and fifteen inches deep.

A. Well, are the boulders there?

Q. Yes, sir, they are.

A. But I am asking a question.

Q. Yes, sir, they are there. People walk over them dryshod in summer. But, assuming that they were not there and that that river is sixty feet wide and you have a fall of 2.78 feet per thousand feet. Can you take a steamboat by them, in its natural condition?

A. I could if the water was deep enough.

Q. I said, fifteen inches of water.

A. I think it could be done.

Q. For the purposes of profitable commerce?

A. Oh, yes, sir.

Q. On 15 inches of water?

A. Oh, yes, sir.

Q. On such a boat as you have described?

A. On such a boat as I have described.

Q. The boat which you have described when it was loaded would rest on the bottom in that place?

A. I would not load it so heavy. I would load it according to the water. I have always done that.

622 Q. How would you go up that slope of ten feet a mile, in a 60-foot river, with a boat over 100 feet long?

A. I might have to warp.

Q. You would have to warp if you could do it at all, wouldn't you?

A. Well, I don't know.

Q. Governor, did you ever go up a river in a channel sixty feet wide at a slope—river 60 feet wide, at a slope of ten feet to the mile, and if so, where?



A. I never did; no, sir.

Q. The Rock Island rapids are about as bad as you care to navigate, aren't they?

A. I have never had a bit of trouble with our boats passing Moline Chain.

Q. But you helped to repair others?

A. I repaired others, and helped others run over it, but I built my boats to run them through the chain. And they always did it.

Q. You never heard of anybody building a boat to run up the Desplaines river?

A. No, sir.

Q. And you never heard of rivermen talking about the Desplaines river as a river of commerce, did you?

COUNSEL FOR COMPLAINANT. I object to that.

The COURT. Objection sustained.

The WITNESS. Shall I answer the question?

The COURT. No.

Q. Now, Governor, as a man who has spent his life in this business, taking such a river as I have described 20 miles long, with those natural difficulties and obstructions, and there being no river above affording profitable commerce, so as to make it worth while to overcome those obstructions, would you say that that 20 miles of river, in its natural condition would be an avenue for profitable commerce?

COUNSEL FOR DEFENDANT. Insert in the question "over-  
623 coming those obstructions by methods of warping or cor-  
delling, which have been described."

Counsel for complainant objecting on the ground that the hypothetical question was not a "fair one considering the actual facts in the case.

The WITNESS. I supposed your question would be along the same lines as the question which the other side proposed, and I answered it. Now, if the facts are as you state them, and upon the assumption that there is nothing on either bank or nothing at the head to come down the river, no freight or no people, it would not pay to navigate the river.

Assuming that at this particular point where the fall was 5.5 feet in 2,000 feet, that within that 2,000 feet there was a very sharp bend of the river, as to how that would affect  
the ability to bring a boat up in that velocity, it would  
626 make it more difficult, but we frequently turn very sharp  
turns in the river. I never have done that, because I  
never navigated a river that had those questions to meet.

Going down a point like that I have described, in such a boat as you have described, we would have to what we call "check" around a place like that, back off and go ahead, back, back, just twist the boat around those points. We did that, we did it safely.

627 WILLIAM H. ZARLEY, a witness for the complainant, testified as follows:

My name is William H. Zarley. Residence, Joliet, Illinois. Am County Surveyor Will County. Have been surveyor for about four years and understand making measurements of lands, distances and things of that kind; know where  
628 Treat's Island is in Desplaines river, was there yesterday afternoon. Went at the request of Mr. Starr and Mr. Reeves. Had with me Mr. O'Callahan and my assistant. I made measurements of the widths of the two channels of the Desplaines river, one on each side of Treat's Island. I mean the width of the water in each channel. I measure the width of each channel at the head of the island and at the foot of the island and at the narrowest points. I made these measurements of both channels. The right hand chan-  
629 nel at the upper end of the island is 527 feet wide. At the foot of the island it was 209.3 feet. At the bridge  
630 or central part of the island it was 145 feet. That is the width of the river. We considered the place at the bridge the narrowest point, it was 145 feet in width. The left hand channel at the head of the island was 276.6 feet and at the foot of the island 185.3 feet and at the narrowest point 128 feet. The water is now wider than in the normal stage of the river. At the head of the island in the right-hand  
631 channel there is very little difference between the width of the river now and at its normal stage. Not very much difference between the width now and at the normal stage  
632 at the foot of the island in the right-hand channel. In the middle or narrowest point of the right-hand channel it is now probably fifteen or twenty feet wider than at normal stage. In the left-hand channel at the head of the island  
633 it is about what it is at the normal width. There is a swamp there with shallow water but we did not count that in the width of the river. At the foot of the island in the left-hand channel, where I said it was 185 feet yesterday, that,

too, represents about the normal flow but the river was 634 wider there yesterday than 185 feet. I meant the 185 feet was about the normal width at that point. The narrowest place in the left-hand channel was 128 feet and that is about the normal condition of the river.

*Cross-Examination.*

Am thirty years old. Lived in Joliet all my life. My testimony as to the normal stage of the river refers to the normal stage since the Drainage Canal water has been turned into river.

635

*Redirect Examination.*

The right-hand channel of the river at the head of the island is some twenty-five to forty feet wider than it was in its normal condition prior to January 17, 1900, when the water of the Drainage Canal was turned in, and that channel at the foot of the island about twenty to twenty-five feet wider and at the narrowest point about fifteen feet wider. In the left-hand channel at the head of the island it is about twenty-five or thirty feet wider than the normal condition prior to January 17, 1900. At the foot of the island the width is about the same and I would say that at the narrowest point it was about the same that it is now.

636

*Recross Examination.*

Have no personal knowledge as to the condition of the river before the water of the Illinois and Michigan Canal was turned in in 1871. I never made measurements of the points prior to yesterday. My comparison with the normal stage of the river since the Drainage District turned in its water is an estimate of what I think the change was. I would not place that estimate as against official surveys, if such have been made. Wherever I have said channel I mean the river itself. Witness here indicates on map the location of the head of the right-hand channel.) There is another little island in the right-hand channel between the head of Treat's Island and 637 the narrowest point given in my statement. I did not measure the channel on either side of that little island. That little island is about 150 feet wide, I guess. The greatest

dimensions I gave were just at the point where you enter the channels on either side of the island at its head. Attention of witness called to page 25 of Ogle & Company's Plat Book of Will County, Illinois, 1893.

640 COUNSEL FOR DEFENDANT. You have put a line across the river marked "A," is that the point where you took the first measurement?

A. Yes, sir.

What appears on the map in the right-hand channel below the head of Treat's Island as a small island is there, as a matter of fact. I did not measure the stream on either side of that island. My measurement of the left-hand channel was taken at the point of entry to the channel, at the place where I have marked it "B." What appears to be a continuous  
641 roadway across the right-hand channel indicates the place where the bridge is. My measurements at the foot of the island are marked "D" and "E." The place marked "F" on the right-hand channel is near the bridge and is the narrowest place. We did not follow the bank of the river on the east side yesterday. We measured the two points at the upper end of the island and we came down about the middle of the island across the mill race that is in the island and went down the west side of the island, and we came back  
642 up the river on the west side. We crossed the race on the bridge. We saw the whole of the river on the west side; did not follow the river along the east side, and think I am prepared to say that those narrowest places were as a  
643 matter of fact the narrowest places in the river. I think I can swear to this. I think I can swear that the river at the bridge is narrower than it is one hundred feet south of that.

Map of Treat's Island and vicinity surveyed in accordance with Act of Congress, August 11, 1880, under direction of W. L. Marshall, Corps of Engineers, U. S. Army, by L. L. Wheeler, U. S. Assistant Engineer, 1888 and 1889, which is identified and marked "Zarley 1"—I see what it is. I don't think I have had occasion to use it. (Witness not sure that he  
644 has ever seen this map before.) With this map before me I think the point in the left-hand channel that we measured as the narrowest point is, in fact, the narrowest point. (Witness indicates point of bridge in left-hand channel.) This point marked "G." I marked the point of  
645 the bridge in the right-hand channel as "H." The place where I took the measure at the head of the island is

marked "I." The points of measurement at the foot of the island are marked "K" and "L." The left-hand at the top was marked "J." The smaller island in the right-hand channel of the river I should say is somewhere in the neighborhood of 150 feet wide, I think about 800 feet long.

Q. You took no measurements of the size of the river from any point on that island to the shore or to the main island, did you?

A. No, sir.

646 Q. In what manner did you take the measurements?

A. We had a fixed base line along the island and triangulated across.

I suppose this map is drawn to scale. It took about an hour and a half to make these measurements. It has been raining most of the time for a couple of weeks. I should

647 say the river is up two or three feet above normal flow.

Well, by normal flow I mean the ordinary flow in the summer. This is Sanitary District water added to the low water stage in the Desplaines river. This normal flow continues generally during the summer. When I say normal width

648 I mean width in the summer without any high water.

There is very little difference between the width of the right-hand channel at the head of the island now and its normal width. At the bridge in that channel the difference is possibly fifteen or twenty feet, I cannot tell within

651 a few feet. At the left-hand channel at the head of the island I would say that the measurement now would represent the normal width. A part of what is swampy on that

side, we did not take into account, but the part we measured is just as wide in summer as it is now. At the foot of the

island on the left-hand channel the measurement I gave would be the normal width, and the narrowest point would be the

same too, and the east channel the narrowest point yesterday would be about normal condition since 1900. On the right-

hand channel, the narrowest point the difference between normal condition and now would be about fifteen feet, the difference somewhere about fifteen or twenty feet.

653 The map marked "Zarley Exhibit 1" offered and received in evidence. (Atlas, p. 3949.)

At the point we have marked "G" the scale shows the river to be about 110 feet wide. The scale used is 300 feet to

654 the inch. Further up the stream where there is a point marked "71," the width shown by the scale is practically

the same as at the point marked "G." At the point you pointed out to me it is more than 100 feet, it is about 110 feet at that narrow place. On the east side of the small island, measuring, it shows about 75 feet. I marked the same  
655 "M." Measuring from the map, the left-hand channel at the foot of the island is 115 feet. At the lower part of the island on left-hand channel, measuring from the map, it appears to be a little over 210 feet. That is where  
656 we had 185 feet. Measuring again, I think that width to be about 215 feet, but it may not be exactly the same place I had it before. In the left-hand channel going down at the final tip of the island, close to that marked "Boring No. 17" it shows about 115 feet. At the point in the right-hand channel where we measured it yesterday as 527 feet, measuring by  
657 the map, it shows 520 feet. In the left-hand channel where I gave the figures as 276.6 feet, measuring by the map, shows a little over 270 feet, about 275 feet. What I call normal is just from my general knowledge of the way the river is, not from measurements. What has been called the mill  
658 race there is no connection with at the present time. I have heard it called the mill race, that is all I know about it. There has been no mill race there within my memory. The narrowest place of the right-hand channel on the right of the little island in that channel is about 90 feet, that is the point marked "M."

Further data introduced in evidence:

659 THE TEXT OF THE DEED OF CESSION OF THE NORTHWEST TERRITORY BY VIRGINIA TO THE GENERAL GOVERNMENT AND OF ALL ACTS OF CONGRESS OF THE UNITED STATES WHICH WERE INTRODUCED IN EVIDENCE AS FOLLOWS:

The deed of cession of the Northwest Territory from Virginia to the General Government dated March 1, 1774.

The ordinance adopted by the Congress of the United States under the Confederation on the 13th day of July, 1787, commonly called the Ordinance of 1787.

The Act of Congress of the United States entitled "An Act providing for the sale of the land of the United States in the territory northwest of the River Ohio and above the mouth of the Kentucky River," approved May 18, 1796.

The Act of Congress of the United States entitled "An Act to divide the territory of the United States northwest

of the Ohio River into two separate governments"; approved May 7, 1800.

The Act of Congress of the United States entitled, "An Act making provision for the disposal of the public land in Indiana Territory, and for other purposes," approved March 26, 1804.

The Act of the Congress of the United States entitled, "An Act dividing the Indiana Territory into two separate governments"; approved February 3, 1809, to U. S. Stats. at Large, 514.

The Act of the Congress of the United States entitled, "An Act to enable the People of Illinois to form a Constitution and State government and for the admission of such State into the Union on an equal footing with the original States"; approved April 18, 1818, 3 U. S. Stats. at Large, 428.

Joint resolution of the Senate and House of Representatives of the United States declaring the admission of the State of Illinois into the Union, adopted December 3, 1818.

STATUTES AND JOINT RESOLUTIONS OF THE GENERAL ASSEMBLY OF  
THE STATE OF ILLINOIS AS FOLLOWS:

660 Preamble of the Constitution of the State of Illinois adopted at Kaskaskia in Convention August 26, 1818, Laws of Illinois 1819, App., p. 1.

Act of the General Assembly of the State of Illinois entitled, "An Act to authorize the building of a bridge across the Desplaines River"; approved February 19, 1839.

Act of the General Assembly of the State of Illinois entitled, "An Act to amend the several laws in relation to the Illinois and Michigan Canal"; approved February 26, 1839.

Act of the General Assembly of the State of Illinois entitled, "An Act declaring the Desplaines River a navigable stream"; approved February 28, 1839.

Act of the General Assembly of the State of Illinois entitled "An Act to authorize Stephen Forbes to construct a dam across the Desplaines River in Cook County"; approved March 3, 1845.

Act of the General Assembly of the State of Illinois entitled "An Act authorizing the building of a bridge in Town-



ship 36 north, Range 10 east, in Will County"; approved February 12, 1849.

Act of the General Assembly of the State of Illinois entitled, "An Act to provide for the completion of the Illinois and Michigan Canal upon the plan adopted by the State in 1836"; approved February 16, 1865.

Act of the General Assembly of the State of Illinois entitled, "An Act to incorporate the Marseilles Land and Water Power Company"; approved March 9, 1867.

Act of the General Assembly of the State of Illinois entitled, "An Act to amend the charter of the Marseilles Land and Water Power Company in the County of La Salle"; approved March 27, 1869.

Act of the General Assembly of the State of Illinois entitled, "An Act to relieve the loan of the City of Chicago upon the Illinois and Michigan Canal and revenues by refunding to said city the amount expended by it in making the improvements contemplated by 'An Act to provide for the completion of the Illinois and Michigan Canal upon the plan adopted by the State in 1836,' approved February 16, 1865, together with the interest thereon as provided by Section 5 of said Act and to provide for issuing bonds therefor"; approved October 20, 1871.

Joint resolution of the House and Senate of the General Assembly of the State of Illinois of 1871 declaring the lease by the Board of Trustees of the Illinois and Michigan Canal to one Adam Smith to use and occupy a part of the 90-foot strip of the canal to be "not valid."

Joint resolution of the Senate and House of Representatives of the General Assembly of the State of Illinois of 1881 instructing the Attorney General to institute legal proceedings against the Kankakee River Improvement Company.

Act of the General Assembly of the State of Illinois entitled, "An Act to cede certain lots and dams in the Illinois River to the United States"; approved May 31, 1887.

Joint resolution of the Senate and House of Representatives of the General Assembly of the State of Illinois in reference to improvements of the Desplaines and Illinois Rivers"; adopted by the House May 27, 1889; concurred in by the Senate May 28, 1889.

Act of the General Assembly of the State of Illinois entitled, "An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois Rivers"; approved May 29, 1889.

661 Act of the General Assembly of the State of Illinois entitled, "An Act conferring police power upon the sanitary district of Chicago"; approved June 16, 1893.

Act of the General Assembly of the State of Illinois entitled, "An Act to amend Sections 12 and 20 of 'An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois Rivers'; approved May 29, 1889; in force July 1, 1889; approved June 10, 1895.

Act of the General Assembly of the State of Illinois entitled, "An Act to amend Sections 12 and 21 of 'An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois Rivers,' approved May 29, 1889, in force July 1, 1889, and amended by an Act in force July 1, 1895"; approved May 13, 1897.

Act of the General Assembly of the State of Illinois entitled, "An Act to amend 'An Act to create sanitary districts and to remove obstructions in the Desplaines and Illinois Rivers'; approved May 29, 1889, in force July 1, 1889"; approved May 10, 1901.

Act of the General Assembly of the State of Illinois entitled, 'An Act in relation to the Sanitary District of Chicago to enlarge the corporate limits of said district and to provide for the navigation of the channels created by such district and to construct dams, water wheels and other works necessary to develop and render available the power arising from the water passing through its channels, and to levy taxes therefor"; approved May 14, 1903.

Act of the General Assembly of the State of Illinois entitled, "An Act recognizing the Desplaines and Illinois Rivers as navigable streams, and to prevent obstructions placed therein, and to remove obstructions therein now existing"; approved December 6, 1907.

662 Thereupon the complainant offered and read in evidence the following extracts from Reports of U. S. Engineers, an extract from Executive Document No. 16 of the House of Representatives, 40th Congress, First Session, entitled as follows:

"Survey of the Illinois River. Report of Brevet Gen. J. H. Wilson on the survey and examination of the Illinois River."

United States Engineers office, Des Moines and Rock Island Rapids Improvement and Illinois and Rock River Surveys. Davenport, Iowa, February 15, 1867.

"General: Having been charged by instructions from the engineering Department with the survey of the Illinois River from La Salle to its mouth, provided for by Act of Congress June 23, 1866, I have the honor to submit the following report." \* \* \*

The supposition is that the survey of this river has immediately in view of its capacity for navigation to La Salle for the largest possible class of steamers that the river will admit when certain obstructions shall have been removed, and ultimately the determination of canal facilities with Lake Michigan and the solution of the question of an adequate supply of water from Lake Michigan as a reservoir for the canal and river during periods of low water. \* \* \*

Subsequently by letter from the engineer department, dated January 8, 1867, I was directed to continue the examination of the Illinois River as far towards its source as there may be reason to believe that it is susceptible of improvement for the purposes of commerce and navigation.

Page 5:

There is no doubt that dredging alone, or at most, dredging and a feeder from the lake, can be made to answer every purpose in the improvement of the Illinois River, if it is to be considered as independent navigation of no other than local importance; but it must be remembered that this river is not the exclusive property of those living upon its banks. It forms already an important link in a network of river navigation extending, with its various branches, through seventeen States of the Union, and is destined at no distant day to become the great commercial highway between the productive States of the west and northwest and the markets of the world.

The Illinois River seems to have been specially designed by nature as the line by which the waters of Lake Michigan are to be connected with those of the Mississippi. Its two principal tributaries, the Desplaines and the Kankakee, rising, the one in Wisconsin, and the other in Indiana, run for many miles almost parallel with the western and southern lake shore, and are separated from the lake basin by a ridge of insignificant height and width. A moment's consideration will show that at no remote period the waters of the lake must have been carried off

by these streams as well as by the St. Lawrence. In fact it is the opinion of many old contractors who are well acquainted with the entire region, that a much more favorable location for a steamboat canal can be obtained from Bridgeport to Section 46 of the present canal, by following the line through Mud Lake; but let this result be as it may, the data herein contained, together with the existence of a canal of limited capacity already in operation, demonstrate beyond a doubt that the waters of the lake may be carried into the Illinois River through a navigable channel of any required dimensions, and at a cost which cannot be regarded as excessive when the objects to be obtained are duly considered.

Page 7:

663 "From the foregoing considerations, I have the honor to recommend the improvement of the Illinois River by a system of locks and dams, to be placed at such points between Lockport and Grafton as may be determined, after a full and careful survey, to be the most advantageous and that navigation shall be extended to the harbor of Chicago by the enlargement of the Illinois and Michigan Canal, so as to adapt it to the use of the largest boats plying upon the Mississippi River."

Page 8:

"We can assert confidently, however, that the interests of commerce and the national defense require navigation between Lake Michigan and the Mississippi River for the largest river steamboats; that all the physical circumstances unite in making the line, by the way of the Illinois and Michigan Canal, and Illinois River as the only feasible route for such a work, and that, therefore, the enlargement of the canal and the improvement of the river by locks and dams as herein described, are demanded by considerations of economy as well as by the public welfare.

It is quite evident from what is already known, that steamboat navigation can be more cheaply provided between Lockport and La Salle by following the line of the river than by enlarging the canal. The State of Illinois has taken this matter in hand, and during its recent session of its Legislature has passed a law provided ultimately for the improvements recommended herein."

## Page 11:

"In closing this report, I beg leave to invite the attention of the engineering department to the interesting report of my assistant, Mr. S. T. Abert, and a statement (marked Exhibit A) compiled by Col. H. A. Ulfers, civil engineer, assistant, giving an outline of the Canadian and New York canal systems."

## And then follows MR. ABERT'S REPORT, page 21:

"The Desplaines Branch of the Illinois approaches to within twelve miles of the western shore of the lake, while the Kankakee, another branch of the same river, may be fifteen or twenty miles from the Great Calumet River, a tributary of the lake at its lower extremity. It is evident that any desired fall can be obtained, from the fact that the Desplaines, at Lockport, twenty-nine miles from the Chicago River, and 33 miles from the lake, is 20 feet below the surface of this great natural reservoir.

"The summit level of the Illinois and Michigan Canal between the last named points is being now cut down to the standard low-water level of the lake, for the purpose of draining the stagnant water of the Chicago River. It is estimated that this channel will discharge 24,000 cubic feet per minute, a quantity equal to two-thirds of the discharge of the Illinois River at Treetop bar during the low-water stage. This supply must have an ameliorating effect upon the worst navigable condition of the river."

## Page 23:

"The practical conclusion from the foregoing statement is that a method of improvement by feeding from Lake Michigan as a reservoir is feasible between La Salle and Grafton, but above that point it will be necessary to employ locks and dams, and small sections of canal at Lockport, Joliet and Marseilles Rapids."

## Page 28:

"It may not be out of place before closing this report to bring together a few facts which establish the superiority of the Illinois River as the route for a navigable connection between the lakes and the Mississippi River."

"The sources of the river being in a lower latitude than any of its rivals, this advantage increases as the river advances in its course, and, as a consequence, less obstruction to navigation and less damage to works of

improvement may be anticipated from the length of the winter and the breaking up of ice in the spring."

Page 29:

"A more important advantage belongs to the valley of the Illinois; upon it alone is a navigation practicable for the largest steamers, by the completion of which a union will be effected with the best navigable conditions of the western rivers, possessing an aggregate length in their main channels of 12,000 miles, exceeding in their collateral channels and tributaries 39,000 miles, and draining an area of 911,000 square miles with 90,300 square miles of lake surface, bearing a commerce of 413,000 tons burden."

664 The REPORT OF COLONEL J. N. MACOMB, "Reports upon transportation routes to the seaboard"; being Appendix CC of the Annual Report of the Chief of Engineers for 1875, p. 95, paragraph 2:

"This survey led to the conclusion that, on every account, the Hennepin Canal and Upper Illinois River, and enlarged canal from Joliet to Chicago, will afford the best through route for navigation between the Mississippi River and Lake Michigan that can be secured in this vicinity.

Paragraph 5:

"Indeed the Hennepin Canal, without the improvement of the Upper Illinois River and the enlargement of the eastern portion of the Illinois and Michigan Canal, would be useless as an outlet for the freights of the Upper Mississippi River; and a careful consideration of the subject has shown that the improvement of the Upper Illinois River, to accord with the scheme of improvement now in progress for its lower portion, is greatly to be preferred as a measure of economy in its broadest sense, rather than to undertake the enlarging of the western portion of the Illinois and Michigan Canal lying between Joliet and the Hennepin basin."

Paragraph 6:

"The improvement of the eastern portion of the Illinois and Michigan Canal involves the further cutting down of the summit-level and enlarging the water-way so as to afford an unfailing supply of water from Lake Michigan for the improved Illinois River."

665 THE REPORT OF MAJOR HANBURY, Chief of Engineers for 1887, part 3, Appendix II, on page 2122, paragraphs 2 and 3.

"The United States and the State of Illinois have long been committed to the project of opening a water communication between the Mississippi River and the northern lakes of capacity sufficient for the wants of commerce and for the exigencies of our national defense, should these ever arise." \* \* \*

"The problem of connecting Lake Michigan with the Mississippi River by a commodious waterway, that could be used for commercial, military and naval purposes, has received attention from our most thoughtful statesmen from the day of Albert Gallatin to the present."

Page 2123:

"Before taking steps looking to the enlargement of the Illinois and Michigan Canal, in the interests of commerce, or as a military expedient, the advisability is suggested of ascertaining whether or not some route can be found from Joliet to Lake Michigan at a point where better facilities can be provided for handling the large commerce of this section. It is thought by some that a practical route exists between the valleys of the Desplaines and Calumet Rivers, along which a canal such as will accommodate the largest vessels using the improved Illinois River can be constructed, at a cost less than that estimated for the enlargement of the Illinois and Michigan Canal from Joliet to Chicago.

Before definitely locating that portion of this route which is to lie between Joliet and Lake Michigan, and which will involve in its construction the expenditure of a very considerable amount of money, every possible route should be examined, and every engineering phase of the problem should be considered. For these reasons I venture to respectfully suggest the advisability of calling the attention of Congress to the necessity of making available the sum of \$10,000; as much thereof as may be necessary to be expended in examinations and surveys between the southern end of Lake Michigan and the Desplaines River at or near Joliet, Illinois, and on the preparation of plans and estimates of cost of constructing, along the most practical route so determined, a waterway having sufficient capacity to accommodate the same class



of vessels and commerce that the present improved condition of the Illinois River is designed to accommodate."

THE REPORT OF THE COMSTOCK BOARD OF 1886, found in this same volume on page 2125, the last paragraph:

"The report of the Board of Engineers shows that to enlarge the canal between Joliet and La Salle and provide for an increased navigation, equal to that contemplated by the improvements in progress on the Illinois River, between La Salle and its junction with the Mississippi, would require an expenditure of money greater than the cost of improving the river itself between Joliet and LaSalle. If such is the case, the river route should be improved as recommended."

667 THE REPORT OF THE CHIEF OF ENGINEERS, J. C. DUANE, found in this same volume on page 2127, paragraph 2:

"With reference to the conditions in this act of Cession regarding the enlargement of the canal, I would remark that the locks and dams that have been and are to be built by the United States below La Salle have been projected with a view to a steamboat navigation of the first class, and the project looks to a continuation of navigation upon the same scale between La Salle and Joliet, and since the cost of an enlargement of the canal between these points, would, it appears, be greater than that of the improvement of the river itself, a river route between those points should be adopted."

668 THE REPORT OF THE BOARD OF ENGINEERS, found in this same volume, on page 2129, paragraph 3:

"The waterway from Chicago to Grafton, on the Mississippi River is a most important one, and when completed there is little doubt that it will richly pay for itself in the reduction and regulation of freights."

THE SURVEY OF 1889 BY CAPTAIN W. L. MARSHALL, Executive Document No. 264, 51st Congress, 1st Session, commencing on page 12, at paragraph 2:

"Chicago River Route. The route proposed follows the Chicago River from its mouth, via its south branch and the Ogden Ditch to Summit, thence parallel to the present location of the Illinois and Michigan Canal, on lower ground, three miles more or less, where it enters the bed of the Desplaines River, which it practically

follows, cutting off bends to Sag Bridge, where it unites with the second or Sag Route."

Page 21, paragraph 7 of the same report:

"The route will be navigable at all stages below a stage corresponding to a discharge of from about 30,000 to 35,000 cubic feet per second, or under all ordinary conditions of the river, the extreme floods occurring at rare intervals, and then being of short duration."

670 BORINGS ALONG THE CHICAGO ROUTE FROM EXECUTIVE DOCUMENT NO. 264 51ST CONGRESS, 1ST SESSION, COMMENCING ON PAGE 69 AT BORING NO. 46.

THESE BORINGS WERE MADE TO DISCOVER THE DIFFERENT STRATA; FIRST THE WATER ON TOP, AND THEN THE STRATA DOWN THROUGH, PREPARATORY TO A DEEP WATER WAY; AND TO SHOW THE DEPTH OF WATER DOWN THIS RIVER IN 1889; THEREUPON READING AS FOLLOWS:

"Boring No. 46. Located in the Desplaines River 400 feet west and 3,400 feet north of the southeast corner of Section 32, Town 38 North, Range 12 East, Lyons Township, Cook County, Illinois,—depth of water 5.5 feet."

"Elevation of surface water 163.1 feet; commenced boring 11.30 A. M., June 25, 1889; completed boring 11:05 A. M. June 28, 1889.

"Boring No. 47. Located in the Desplaines River, 2,400 feet west and 1,600 feet north of the southeast corner of Section 6, Township 57 North, Range 12 East, Palos Township, Cook County, Illinois. Depth of water six feet. Boring made June 29, 1889.

"Boring No. 48. Located in Desplaines River, fifty feet from the north bank, two hundred feet west and twenty-two hundred feet north of the southeast corner of Section 6, Township 37 North, Range 12 East, Palos Township, Cook County. Depth of water nine feet. Boring made July 5, 1889.

"Boring No. 49. Located 1,300 feet west and twelve hundred feet north of the southeast corner of Section 32, Township 38 North, Range 12 East, in the Desplaines River, ten feet below the northwest pier and eighty feet from the northwest abutment of wagon bridge over the Desplaines River at Willow Springs, Lyons Township, Cook County, Illinois. Depth of water 3.5 feet. Boring made July 9th, 1889.

"Boring No. 50, located in the Desplaines River, one thousand feet east and twenty-five hundred feet south of the northwest corner of Section 5, Township 37 North, Range 12 East, Palos Township, Cook County, Illinois. Depth of water six feet. Made July 12th, 1889.

"Boring No. 51. Located in Desplaines River three hundred feet north and thirteen hundred feet east of the southwest corner of Section 6, Township 37 North, Range 12 East, Palos Township, Cook County, Illinois. Depth of water eight feet. Taken July 15, 1889.

"Boring No. 52. Located in Desplaines River, 100 feet south and 1,300 feet west of the northeast corner of Section 12, Township 37 North, Range 11 East, on the line between Downer's Grove Township, DuPage County, and Lemont Township, Cook County, Illinois. Depth of water 8.7 feet. Taken July 7, 1889.

"Boring No. 53. Located in the Desplaines River, 1,600 feet east and 1,400 feet south of the northwest corner of Section 12, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water five feet. Taken July 20th, 1889.

"Boring No. 54. Located in Desplaines River, 300 feet west and 2,300 feet north of the southeast corner of Section 11, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 7.1 feet. Taken July 23, 1889.

"Boring No. 55. Located in Desplaines River, 2,400 feet west and 700 feet north of the northeast corner of Section 11, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 7 feet. Taken July 25, 1889.

671 "Boring No. 56. Located in the Desplaines River, 400 feet south and 600 feet east of the northwest corner of Section 14, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 8.5 feet. Taken July 25, 1889.

"Boring No. 57. Located in the Desplaines River, 1,800 feet south and 1,500 feet west of the northeast corner of Section 15, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 8 feet. Taken July 30, 1889.

"Boring No. 58. Located in Desplaines River, 1,700 feet east and 2,200 feet north of the southwest corner of Section 15, Township 37 North, Range 11 East, on the line

between DuPage and Cook Counties, Illinois. Depth of water six feet. Taken July 30, 1889.

"Boring No. 59. Located in Desplaines River, 1,000 feet north and 500 feet west of the southeast corner of Section 16, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 11.5 feet. Taken August 1, 1889.

"Boring No. 60. Located in the Desplaines river, 2,600 feet east and 50 feet north of the southwest corner of Section 16, Township 37 North, Range 11 East, on the line between DuPage and Cook Counties, Illinois. Depth of water 10.4 feet. Taken August 1, 1889."

672 LIST OF MERCHANTS' STEAMBOATS NAVIGATING ON THE MISSISSIPPI RIVER AND ITS TRIBUTARIES, SHOWING BOATS DRAWING THREE FEET OF WATER AND LESS AS FOLLOWS:

"No. 7, name Abner Gile, gross tonnage, 124.18, net tonnage 124.18, length of boat 110 feet, breadth 21 feet, depth 3 feet; where built, LeClaire, Iowa; home port, Galena, Illinois.

No. 13, name Advance, gross tonnage 82.83, net tonnage 59.79, length 70, breadth 18, depth two feet; where built, Madison, Arkansas; home port, Memphis, Tennessee.

No. 14, name Aggie, gross tonnage 88.57, net the same, length 92.4, breadth 20.4, depth 3 feet; where built, Manchester, Ohio; home port, Kansas City, Missouri.

No. 26, name Alpha, gross tonnage 56, net same, length 121 feet and three-tenths, breadth 21, depth 2.7; where built, Jefferson, Texas; home port, New Orleans, Louisiana.

No. 52, name Belgrade, gross tonnage 89.26, net the same, length 96 feet, breadth 18 feet, depth 2.5; where built, Vincennes, Indiana; home port, Evansville, Indiana.

No. 56, Belle Crooks, gross tonnage 78.43; net tonnage the same, length 91, breadth, 22, depth 3; where built, Jeffersonville, Indiana; home port, New Orleans, Louisiana.

No. 68, name Bessie Siler, gross tonnage 54.42, net tonnage 49.38, length 93, breadth 16, depth 3; where built, Harmar, Ohio; home port, Wheeling, West Virginia.

No. 78, name Bob Henry, gross tonnage 80.24, net 55.44, length 91.4, breadth 16.6, depth 2.4; where built, Charleston, W. Va.; home port, Wheeling, West Virginia.

No. 81, name *Border City*, gross tonnage 96.96, net tonnage 88.86, length 108, breadth 21, depth 2.5; where built, Fort Smith, Arkansas; home port, Memphis, Tennessee.

No. 82, name *Boston*, gross tonnage 70.77, net tonnage 57.10, length 65, breadth 16, depth 2.5; where built, Pittsburg, Pennsylvania; home port, Pittsburg, Pennsylvania.

No. 86, name *Bright Star*, gross tonnage 71.52, net tonnage 41.66, length 89.6, breadth 18.7, depth 2.8; where built, Calico Rock, Arkansas; home port, Memphis, Tennessee.

No. 88, name *Buckeye*, gross tonnage 69.62, net tonnage the same, length 102, breadth 16.4, depth 3; where built, Reed's Landing, Minnesota; home port, LaCrosse, Wisconsin.

No. 91, name *Burnside*, gross tonnage 100.45, net tonnage the same, length 114.6, breadth 20.4, depth 3; where built, Harmar, Ohio; home port, Wheeling, West Virginia.

No. 39, name *C. C. Martin*, gross tonnage 67.78, net tonnage the same, length 103.2, breadth 18.3, depth 3.9; where built, Harmar, Ohio; home port, Wheeling, West Virginia.

No. 103, name *Caney Port*, gross tonnage 83.90, net tonnage the same, length 126, breadth 19, depth 2; where built, Paducah, Kentucky; home port, New Orleans, Louisiana.

No. 108, name *Carrie M. Kraft*, gross tonnage 81.16, net tonnage the same, length 102, breadth 20, depth 3; where built, Parkersburg, West Virginia; home port, Memphis, Tennessee.

No. 135, name *Clara*, gross tonnage 60.95, net tonnage the same, length 87, breadth 14, depth 2.5; where built, Leon, West Virginia; home port, Wheeling, West Virginia.

No. 136, name *Clara Belle*, gross tonnage 71.48, net tonnage 56.66, length 100, breadth 18.8, depth 2; where built, Point Pleasant, W. Va.; home port, Wheeling, West Virginia.

673 No. 147, name *Cora*, gross tonnage 75.18, net tonnage the same, length 105, breadth 22, depth 2.8; where built, Pittsburg, Pennsylvania; home port, Cincinnati, Ohio.

No. 152, name *Crescent*, gross tonnage 82.93; net tonnage the same, length 106, breadth 18, depth 3; where built, Letart Falls, Ohio; home port, New Orleans, Louisiana.

No. 155, Crusader, gross tonnage 302.07, net tonnage 186.77, length 138.8, breadth 22.3, depth 2.9; where built, Nashville, Tennessee; home port, Paducah, Kentucky.

No. 161, name D. T. Watson, gross tonnage 80.45, net tonnage 80.45, length 99, breadth 17, depth 2.6; where built, Pittsburg, Pennsylvania; home port, Pittsburg, Pennsylvania.

No. 182, name Dyersburg, gross tonnage 73.08, net tonnage the same, length 93, breadth 18.4, depth 3; where built, Dyersburg, Tennessee; home port, Memphis, Tennessee.

No. 186, E. T. Holman, gross tonnage 102.48, net tonnage 71.59, length 100, breadth 20, depth 3; where built, Nashville, Tennessee; home port, Paducah, Kentucky.

No. 199, name Eli, gross tonnage 140.25, net tonnage 120.25, length 106, breadth 21.5, depth 2.5; where built, Little Rock, Arkansas; home port, Memphis, Tennessee.

No. 201, name Ella, gross tonnage 284.70, net tonnage 184.70, length 148, breadth 28, depth 2.5; where built, Jeffersonville, Indiana; home port, Memphis, Tennessee.

No. 216, name Experiment, gross tonnage 62.35, net tonnage 34.99, length 106.5, breadth 16.2, depth 3; where built, Evansville, Indiana; home port, Evansville, Indiana.

No. 226, name Frank Preston, gross tonnage 61.14, net tonnage the same, length 103.5, breadth 19.3, depth 2.9; where built, Catlettsburg, Kentucky; home port, Cincinnati, Ohio.

No. 231, name Frederick, gross tonnage 82.51, net tonnage the same, length 96.4, breadth, 14.3, depth 3; where built, St. Louis, Mo.; home port, St. Louis, Mo.

No. 234, name C. B. Montieth, gross tonnage 69.03, net tonnage 62.91, length 103.4, breadth 18.2, depth 2; where built, Long Beach, West Virginia; home port, Wheeling, W. Va.

No. 341, name J. W. Mills, gross tonnage 86.98, net tonnage the same, length 109.7, breadth 22.2, depth 3; where built, Paducah, Kentucky; home port, Galena, Illinois.

No. 360, name Jimmie B., gross tonnage 58.32, net tonnage the same, length 97.3, breadth 20, depth 2.3; where built, Pt. Pleasant; home port, Vicksburg, Mississippi.

No. 390, name Josephine Spengler, gross tonnage 104.50, net tonnage the same, length 106, breadth 25, depth 3; where built, Vicksburg, Mississippi; home port, New Orleans, Louisiana.

No. 397, name Julian Gracey; gross tonnage 81.71, net

tonnage the same, length 100, breadth 22, depth 2.8; where built, Clarksville, Tennessee; home port, Paducah, Kentucky.

No. 417, name Leroy, gross tonnage 66.44, net tonnage 48.17, length 60, breadth 14, depth 2.7; where built, Greenville, Mississippi; home port, Memphis, Tennessee.

No. 420, name Lillian, gross tonnage 91.75, net tonnage the same, length 124.5, breadth 21.3, depth 3; where built, Ashland, Kentucky; home port, Wheeling, West Virginia.

No. 424, name Lion, gross tonnage, 71.96, net tonnage the same, length 100, breadth 15.6, depth 3; where built, Lyons, Iowa; home port, LaCrosse, Wisconsin.

No. 433, name Lizzie Bayliss, gross tonnage 110.05, net tonnage the same, length 117, breadth 21, depth 3; where built, Wellsville, Ohio; home port, Vicksburg, Mississippi.

674 No. 442, name Lucy Robertson, gross tonnage 103.84, net tonnage 81.89, length 95 feet, breadth 20.5, depth 2.9; where built, Johnsonville, Tennessee; home port, Paducah, Kentucky.

No. 463, name Mary Ruble, gross tonnage, 65.73, net tonnage the same, length 100, breadth 16.7, depth 3; where built, Carrsville, Kentucky; home port, Cincinnati, Ohio.

No. 464, Mary C. Cantwell, gross tonnage 64.73, net tonnage the same, length 100, breadth 28, depth 3; where built, Pittsburg, Pennsylvania; home port, Pittsburg, Pennsylvania.

No. 474, name Mike Davis, gross tonnage 112.28, net tonnage 78.92, length 96, breadth 17, depth 3; where built, Wheeling, W. Va.; home port, Paducah, Kentucky.

No. 479, name Minnie H.; gross tonnage 130.24, net tonnage the same, length 133, breadth 25, depth 3; where built, Reed's Landing, Minnesota; home port, St. Paul, Minnesota.

No. 510, name Novelty, gross tonnage 63.14, net tonnage 49.95, length 76.4, breadth 16.4, depth 3; where built, Manchester, Ohio; home port, Vicksburg, Mississippi.

No. 513, name Octavia, gross tonnage 95.23, net tonnage 62.84, length 76.5, breadth 16.5, depth 3; where built, Greenville, Mississippi; home port, Memphis, Tennessee.

No. 516, name Olivette, gross tonnage 130.01, net tonnage 94.44, length 120, breadth 22, depth 3; where built, Harmar, Ohio; home port, Cincinnati, Ohio.

No. 537, name Phil Scheckel, gross tonnage 108, net tonnage the same, length 114, breadth 20.5, depth 3; where



built, Waubeck, Wisconsin; home port, La Crosse, Wisconsin.

No. 541, name Pinhook, gross tonnage 160.36, net tonnage 90.60, length 94, breadth 18, depth 3; where built, Chattanooga; home port, Chattanooga, Tennessee.

No. 546, name Prince, gross tonnage 107.88, net tonnage the same, length 120, breadth 21, depth 2.8; where built, Harmar, Ohio; home port, Wheeling, W. Va.

No. 550, name R. B. Kendall, gross tonnage 70, net tonnage 70, length 105, breadth 18, depth 3; where built, Pittsburg, Pennsylvania; home port, Pittsburg, Pennsylvania.

No. 558, name R. E. Philips, gross tonnage 84.06, net tonnage 79.60, length 110.8, breadth 20, depth 2.3; where built, Freedom, Pa.; home port, Wheeling, West Virginia.

No. 554, name R. L. Cobb, gross tonnage 365.33, net tonnage 204.56, length 145.1, breadth 28.5, depth 3; where built, Little Rock, Arkansas; home port, Memphis, Tennessee.

No. 560, name Reindeer, gross tonnage 56.36, net tonnage the same, length 103, breadth 19, depth 3; where built, Terre Haute, Indiana; home port, Louisville, Kentucky.

No. 573, name Rob Roy, gross tonnage 100.02, net tonnage 84.63, length 119, breadth 19, depth 2.9; where built, Lafayette, Indiana; home port, Kansas City, Missouri.

No. 577, name Roy Lynds, gross tonnage 64.19, net tonnage the same, length 101, breadth 23, depth 3; where built, Jeffersonville, Indiana; home port, St. Joseph, Missouri.

No. 578, name Rozelle, gross tonnage 62.46, net tonnage 50.35, length 110, breadth 19, depth 3; where built, Charleston, W. Va.; home port, Wheeling, W. Va.

No. 581, name S. P. Pohn, gross tonnage 86.34, net tonnage 56.27, length 75, breadth 15.5, depth 3; where built, Lockhart's Landing, Arkansas; home port, Memphis, Tennessee.

No. 596, name Scout, gross tonnage 55.68, net tonnage the same, length 85, breadth 15, depth 2.8; where built, Freedom, Pennsylvania; home port, Pittsburg, Pennsylvania.

675 No. 638, name Tom Spurlock, gross tonnage 93.05, net tonnage 86.30, length 114.3, breadth 22.9; where built, Ashland, Kentucky; home port, Cincinnati, Ohio.

No. 642, name Two Brothers, gross tonnage 69.13, net tonnage 48.13, length 91.9, breadth 16, depth 2.5; where built, Pittsburg, Pennsylvania; home port, Pittsburg, Pennsylvania.

No. 643, name Undine, gross tonnage 72.90, net tonnage the same, length 112, breadth 30, depth 2; where built, Mound City, Illinois; home port, Kansas City, Missouri.

No. 651, name Vienna, gross tonnage 73.17, net the same, length 89.6, breadth 24, depth 2.3; where built, Plattsmouth, Nebraska; home port, St. Louis, Missouri.

No. 663, name W. L. Norton, gross tonnage 63.01, net tonnage 43.60, length 67.5, breadth 12, depth 3; where built, Lenoirs, Tennessee; home port, Chattanooga, Tennessee.

No. 665, name W. P. Bishop, gross tonnage, 69.09, net tonnage 48.09, length 93.9, breadth 16.5, depth 2.5; where built, Pittsburg, Pennsylvania; home port, Omaha, Nebraska.

No. 668, name Water Lilly, gross tonnage 141.17, net tonnage 89.96, length 112, breadth 21, depth 3; where built, Knoxville, Tennessee; home port, Chattanooga, Tennessee.

No. 678, name William Wagner, gross tonnage 52.25, net tonnage the same, length 100, breadth 17, depth 2; where built, Pittsburg, Pennsylvania; home port, Wheeling, West Virginia.

676 EXTRACTS FROM DOCUMENT NO. 263, HOUSE OF REPRESENTATIVES, 59TH CONGRESS, FIRST SESSION, REPORT UPON THE SURVEY, WITH PLANS AND ESTIMATES OF COST FOR A NAVIGABLE WATERWAY FOURTEEN FEET FROM LOCKPORT, ILLINOIS, BY WAY OF DESPLAINES AND ILLINOIS RIVERS, TO THE MOUTH OF SAID ILLINOIS RIVER, AND THENCE BY WAY OF THE MISSISSIPPI RIVER TO ST. LOUIS, MISSOURI, AND FOR A NAVIGABLE WATERWAY OF SEVEN AND EIGHT FEET DEPTH, RESPECTIVELY, FROM THE HEAD OF NAVIGATION OF ILLINOIS RIVER AT LA SALLE, ILLINOIS, THROUGH SAID RIVER TO OTTAWA, ILLINOIS. BY THE MISSISSIPPI RIVER COMMISSION COVERING THE SECTION BELOW THE MOUTH OF THE ILLINOIS RIVER AND BY A BOARD OF OFFICERS OF THE CORPS OF ENGINEERS, UNITED STATES ARMY, COVERING THE SECTION ABOVE THE MOUTH OF THE ILLINOIS RIVER, DECEMBER 19TH, 1905.

Page 40. "Velocity of current in the upper Illinois and lower Desplaines River during extreme high water. In

order to ascertain whether the currents which obtain in the upper Illinois and lower Desplaines Rivers during extreme high water would prohibit navigation at such times, velocities were computed at 16 points between Utica and Joliet for the highest water on record for each station. These results, which are shown in the following table, are based upon the following field measurements, and are entirely independent of any assumptions or theories. The high water elevations were taken from the high water line on our general profile, which were platted from actual gauge readings and reliable readings and reliable high water marks. The areas of the discharging sections were obtained by platting and computing the cross sections from soundings and stadia elevations taken in the field. \* \* \*

The discharges for the sections one mile below the mouth of the Kankakee River, at the Kankakee cut-off, and 1/4 mile below the foot of Treat's Island, were obtained from discharge curves platted from measurements taken at Elgin, Joliet and Eastern Railroad bridge at the Kankakee cut-off, and 2,000 feet above Jackson Creek, respectively.

For the sections in Joliet and 1 1/2 miles below the Brandon bridge the discharges were derived from tables showing the discharge of the Drainage Canal and the Desplaines River, prepared for each day of the year by the Sanitary District of Chicago."

677 EXTRACTS FROM THE HOUSE DOCUMENT NO. 263, 59TH CONGRESS, FIRST SESSION, PAGES 45 AND 46, AS FOLLOWS:

*"DAMS.*

In order that there may be no damage inflicted on the bottom lands above the level of the crests of the proposed dams, the Board decided that all of the dams should be movable in character.

In accordance with your instructions, plans and estimates were prepared of dams of the Chanoine-wicket type. This form was adopted, not because it was necessarily the best that might be devised, but because this type has given satisfactory service on the Ohio and Kana-wha Rivers, and because the estimates prepared on this basis will cover the cost of any other desirable type in

case later experience should prove that some other type is preferable.

The longest wickets now in use are less than 16 feet in length, and, as it is doubtful whether wickets longer than 18 feet can be handled conveniently, the latter length has been adopted as the maximum in the preparation of the plans and estimates.

The width of wickets is the standard width of 3 feet 9 inches, with 3-inch space between wickets. No provision has been made for service bridges, from which to operate the dams, as the experience at Davis Island Dam and Dam No. 6 on the Ohio River has demonstrated that the wickets can be safely and rapidly operated from boats or scows.

The design prepared by Mr. F. B. Maltby, United States assistant engineer, for the proposed dam across the Mississippi River at Alton, Ill., in connection with the extension of this project to St. Louis, Mo., has embodied in it the best American practice on Chanoine-wicket dams, and his design has been followed on this work.

On the Ohio River dams, which are now under construction, as well as on those in operation, Chanoine-wickets are used to close the channel, and bear-trap dams of various widths are used to control the water levels. On the Kanawha River, however, the water levels have been controlled by the Chanoine-wickets without the assistance of any other form of dam. The designs for the present projects follow the Kanawha River practice and make no provision for any other type than Chanoine-wickets. The entire width of the river is closed by a continuous line of Chanoine-wickets without any intermediate piers.

The cross section of the river was platted at each of the seven proposed dam sites, and from these cross sections were determined the thickness of the concrete base and the length of wicket for each of the nine proposed dams required under the different 14-foot projects.

The main portion of each abutment has been designed with a top width of 5 feet and a bottom width equal to about four-tenths of the height. The upper wing, which extends into the bank at right angles to the main portion, has a top width of 3 feet. These two parts of each abutment are built up to the same level as the lock walls

at the opposite end of the dam, or about 2 feet above high water. The lower wing swings the bank at an angle of 30 degrees with the main portion of the abutment and is stepped down from 4 to 14 feet, according to the height of the abutment and the level in the pool below the dam.

The location, principal elevations, and dimensions of the dams required under the different 14-foot projects are given in the following table:

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PRINCIPAL ELEVATIONS AND DIMENSIONS OF DAMS REQUIRED UNDER 14-FOOT PROJECTS.

No. of Dam.	Location.	Station.	Miles from Grafton.	Upper level at low- water crest of dam.	High water in 1904 or 1892.	Lower level at low water.
b1	Jackson street, Joliet.	1523.0	288.5	545	549.6	535.0
2	Foot of Treats Island.	1473.9	279.2	515	514.0	505.0
3	1½ miles below Kankakee river.	1434.1	271.6	505	510.0	494.0
4	At Marseilles.	1306.0	347.3	491	493.2	485.0
5	Head of Bulls Island.	1273.0	241.1	472	476.0	{ 466.0
6	Head of Buffalo Rock.	1243.0	235.5	466	472.4	{ 464.0 460.0
7	Lovers Leap.	1220.2	229.9	460	469.4	451.6
a7	Lovers Leap.	1220.2	229.9	464	469.4	451.6
8	Foot of Plum Island.	1213.8	231.1	460	468.6	451.2
a8	Foot of Plum Island.	1213.8	231.1	464	468.6	451.2

a Not printed.

b Dam No. 1 of the Economy Light and Power Co., Joliet, Ill.

PRINCIPAL ELEVATIONS AND DIMENSIONS OF DAMS REQUIRED  
UNDER 14-FOOT PROJECTS.

(Concluded.)

No. of Dam.	Head at low water.	Project.	Length of dam.	Eleva- tion of bed rock.	Eleva- tion of top of sill.	Length of wickets. Ft. in.	No. of map.
b1	10.0					0 0	57
2	10.0		600	498	503.8	12 0	56
3	11.0		840	483	488.2	18 0	55
4	6.0		830	478	481.7	10 0	52
5	6.0	B and D— }	c750	455	460.8	12 0	52
	8.0	A and C— }					
6	6.0		500	443	449.2	18 0	
7	8.4	B	800	439	447.2	13 9	51
a7	12.4	A	800	439	447.2	18 0	51
8	8.8	D	600	438	443.2	18 0	51
a8	12.8	C	600	438	447.2	18 0	51

a Not printed.

b Dam No. 1 of the Economy Light and Power Co., Joliet, Ill.

c Section 470 feet long over north channel, and section 280 feet long over south channel."

679 PORTION OF REPORT OF THE INTERNAL IMPROVEMENT COMMISSION OF ILLINOIS, SECTION 8, "THE UPPER ILLINOIS," AS FOLLOWS:

"8. THE UPPER ILLINOIS.

"The Upper Illinois division covers 56.2 miles from the head of Lake Joliet at Brandons bridge, on the Desplaines River, to the head of the Henry pool at Utica bridge, though geographically, the Illinois River is formed by the union of the Desplaines and Kankakee Rivers, thirteen miles below Brandons bridge.

"The valley of erosion headed for Lake Michigan, is a case of arrested development, with declivities adjusted to the resisting rock stratification. Through the valley bottom, the modern stream has defined its course and a normal stream-bed has developed with true flood plains, through unfilled remnants of an older and greater stream-bed still exists, showing progressive shrinkage in the survey period. These old polls still aggregate a length of 22 miles and still carry a good depth of water—Lake Joliet, at 76.5 feet below Chicago datum (low water of 1847 in Lake Michigan), Lake DuPage at 90.2 feet, and Marseilles pool, originally above the Kickapoo reef, but now controlled by the dam, at 101.4 feet. All elevations refer to the low water of 1883.

"Between the Lakes Joliet, DuPage, are sharp pitches.

Treat's Island, and the dump of the DuPage River mouth, and against over Cincinnati limestone, below Lake DuPage and opposite the mouth of the Kankakee. The Marseilles dam is 25.8 miles below the mouth of the Kankakee, and 38.8 miles below Brandons bridge. It is at the head of a descent, on the coal measures, dropping some 28 feet in six miles, and at Ottawa, at the mouth of the Fox, the level is 132.2 feet below Chicago datum. From Marseilles to Utica bridge is 17.4 miles, the bed below the rapids in St. Peters sandstone, with a fall of about half a foot per mile to the lower end of Buffalo Rock; thence some 12 feet in four miles to Starved Rock, the declivity terminating on the water-line out-crop 0.3 miles above Utica bridge. The original low water elevation (1871) at this point, was approximately, 147 feet below Chicago datum; but the pool level produced by the dam at Henry, is 142.2 feet below Chicago datum (low water of 1883), with a declivity of some 0.6 feet on the following two and a half miles, the channel at the head of the pool having greatly silted in recent times.

"From the head of Lake Joliet to the head of the pool at Starved Rock, also the head of the alluvial valley of the lower Illinois is then, 55.9 miles, with an original fall of 70.5 feet, and a present fall of 4.8 feet less. The river throughout this distance has an average width of about 600 feet, generally subdivided by islands below Ottawa, and the bank heights vary from 8 to 23 feet. These banks are overflowed, more or less, in two years out of three.

"A flood record was kept at Morris by M. L. W. Claypool for the 56 years, 1834 to 1890. This shows twenty years in which the river was not out of banks, and fifty-three floods in the other 36 years. Of these seventeen exceeded 17 feet above low water, nineteen ranged from 14 to 17 feet, and seventeen ranged from 10 to 14 feet. The time out of banks averaged nine days for the flood years.

"Mr. Claypool's estimate of the overflowed lands above Marseilles Dam, in La Salle and Grundy Counties, is still the most satisfactory, and these lands cover 75 per cent. of the values between Joliet and Utica. The estimate is as follows:



"Under 10 feet. ....	905 acres	11%
"From 10 to 14-15 feet. ....	4,050 acres	52%
"14-15 to 18 feet. ....	2,085 acres	27%
"18 to 20 feet. ....	739 acres	10%
<hr/>		
"Total. ....	7,779 acres	100%

"(20 to 23 feet 390 acres).

"On a comparable basis the total overflowed lands in Will County were estimated at 1,000 acres, 250 of which are marginal lands of little value, and the remainder chiefly in Treat's Island, and the bottoms of DuPage River and Jackson Creek.

"The lands between Marseilles and Utica, for the equivalent stage of 20 feet at Morris, having been estimated at 3,050 acres, about two-thirds of the area being in the four miles below Buffalo Creek, and more affected by back water from the lower river than by head water floods. These lands are largely infertile.

"The value of all these lands was carefully estimated in 1890, as follows: 11,829 acres, \$61c, \$0.00.

"Mr. Claypool's plane of reference happens to be an even hundred feet below Chicago datum, by the last survey, and 0.3 feet above the low water of 1883 at Morris bridge (built in 1856) and 0.66 above the low water of 1887, and less than a foot above the lowest known water. The highest known flood at Morris was 23 feet, and was observed by William Marquis, in March, 1830. The Claypool record begins with Mr. Claypool's arrival in Morris in March, 1834. In the thirty-four year (1834-67), thirteen floods occurred exceeding 17 feet, and seven of these ranged between 19.5 and 20.5 feet. The four notable floods in the twenty-two following years (1868-89), all ranged between 17 and 18 feet, the excessive height of 1883 being due to the breaking of the ice gorge and the great dam at Wilmington, and the loosing of the water stored in the 12-mile pool above. The two most notable floods since 1890 are, 1892 at 20.6 feet, and 1904 at 19.2 feet.

"Of the fifty-three floods, from 1834 to 1890, thirty-eight have occurred in the three months, February, March and April, the majority being identified with the spring break-up. The Kankakee usually breaks up and runs out before the ice moved at Morris and at other points in the upper Illinois, thus producing gorges and abnormal

stages of water. Such action has been less frequent since the shores and islands were cleared of their timber.

"The ice flood of February, 1887, was one of the four notable floods in the 1868-89 period, and its volume was carefully estimated from the heights on dams, as follows:

	Second-feet.
"Joliet, Desplaines River. . . . .	5,575
"Wilmington, Kankakee River. . . . .	25,225
"Marseilles, Illinois River. . . . .	45,000
"Dayton, Fox River. . . . .	13,680
"Ottawa (sum of the above). . . . .	58,680
"La Salle estimated. . . . .	60,000

"The greatest flood at Joliet in thirty-three years prior to 1890, was estimated at 6,550 feet. The greatest flood at Wilmington, in the nineteen years prior to 1890 (ice gorge flood of 1883 excepted) was estimated at 35,600 second feet. The flood of 1887 was considered extraordinary for the Fox.

"Full measurements made at Morris after 1890, indicate the ice flood of 1887 was abnormally high by about two feet, or that the estimated volumes from the dams were short by 15 to 20 per cent. which is not probable.

"The flood of 20.6 feet at Morris, in May, 1892, is probably the greatest in the historic period, that of March, 1830, being no doubt abnormal from ice effects. This flood was measured by Charles L. Harrison, Assistant Engineer Sanitary District of Chicago, on May 6, and the volume found at 73,730 second feet. All the available data were reduced for the Sanitary District by James A. Seddon, in 1901, and the equivalents for Morris deducted as follows: (Claypool datum.)

"70,000 second feet. . . . .	20.30 feet in height
"65 000 second feet. . . . .	19.47 feet in height
"60,000 second feet. . . . .	18.60 feet in height
"55,000 second feet. . . . .	17.68 feet in height
"50,000 second feet. . . . .	16.70 feet in height
"45,000 second feet. . . . .	15.65 feet in height
"40,000 second feet. . . . .	14.52 feet in height
"35,000 second feet. . . . .	13.29 feet in height
"30,000 second feet. . . . .	11.94 feet in height
"25,000 second feet. . . . .	10.43 feet in height

"20,000 second feet.....	8.79 feet in height
"15,000 second feet.....	6.92 feet in height
"10,000 second feet.....	4.79 feet in height

"The basin areas of the Upper Illinois are as follows:

"Distance from Brandon's Bridge.

"Desplaines R., 1392 Sq. mi. }	6,540 sq. mi.	13 mi.
"Kankakee R., 5148 sq. mi. }		
"Morris. . . . .	7,300 sq. mi.	22.7 mi.
"Marseilles. . . . .	7,500 sq. mi.	38.8 mi.
"Ottawa (Fox R.). . . . .	10,230 sq. mi.	46.2 mi.
"Utica Bridge. . . . .	10,365 sq. mi.	56.2 mi.

"The extreme flood expectation in the Morris-Marseilles reach, is 70,000 second feet, taking the basin as normal. The flood of 1892 seems to have reached the limit for streams in this region of the country.

"The natural low water volume of the Illinois at Morris is nominal, not exceeding 250 to 350 second feet in 1887, practically at extreme low water, after allowing for canal water from Lake Michigan. A measurement of 456 second feet was made on the Kankakee River near its mouth, in September, 1867. Extreme low water at Wilmington for twelve years, 1871-83, was estimated at 420 second feet. The Desplaines River practically goes dry above Joliet. The Mazon was dry in 1867. The Fox measured 526 second feet in September, 1867. The canal authorities have measured a low water of 633 feet at La Salle.

"Assuming an ordinary low water volume of 1,000 second feet, the effect of introducing 10,000 second feet from Lake Michigan, at Morris, will be to raise the water 5.2 feet above the Claypool plane, and for 14,000 feet to 6.9 feet.

"Extreme floods may be assigned to two causes:—Heavy winter snow on a frozen ground surface, produces a great break-up rise, followed by extreme low water, as in 1867 and 1887. Again, long continued rains fill the ground and marshes to overflowing and the excess runs away in a great flood, as in the several great floods of May and June. In long continued dry periods the storage of marshes and ponds is exhausted, and as the sub-soil is generally impermeable, extreme low water follows. In ordinary years, the floods are moderate and the low water volume well sustained.

"It is evident that any improvement for navigation should modify the regimen of the stream as greatly as possible, rather than as little as possible, as in all official projects. In adapting the Mohawk River (N. Y.) to a deepwater navigation, the Board of Engineers on Deep Waterways (1897-1900) projected a depth of 30 feet, even for a navigable limit of 21 feet, in order to bring flood velocity and slope within moderate limits. In like manner the capacity of the prism in the Upper Illinois is conditioned by flood volumes, without regard to the depth required for navigation. A project developed on such principles, not only provides a deep water channel, but substantially does away with overflows, and makes possible water-power development."

682 SENATE RESOLUTION NO. 26 OF THE 45TH GENERAL ASSEMBLY,  
STATE OF ILLINOIS, AS FOLLOWS:

"Senate Joint Resolution No. 26.

Resolved by the Senate, the House of Representatives concurring Herein, That there shall be submitted to the electors of this State at the next election of members of the General Assembly, a proposition to amend the constitution of this State, to-wit:

Resolved, That the separate section of the constitution of this State relating to the canal be amended to read as follows:

The Illinois and Michigan Canal, or other canal or waterway, owned by the State shall never be sold or leased until the specific proposition for the sale or lease thereof shall first have been submitted to a vote of the people of the State at a general election, and have been approved by a majority of all the votes polled at such election. The General Assembly shall never loan the credit of the State or make appropriations from the treasury thereof in aid of railroads or canals.

Provided, That any surplus earnings of any canal, waterway or water power may be appropriated or pledged for its enlargement, maintenance or extension; and,

Further Provided, That the General Assembly, by suitable legislation, provide for the construction of a deep waterway or canal from the present water power plant of the Sanitary District of Chicago, at or near Lockport, in the Township of Lockport, in the County of Will, to a

point in the Illinois River at or near Utica, which may be practical for a general plan and scheme of deep waterway along a route which may be deemed most advantageous for such plan of deep waterway; and for the erection, equipment and maintenance of power plants, locks, bridges, dams and appliances sufficient and suitable for the development and utilization of the water power thereof; and authorize the issue, from time to time, of bonds of this State in a total amount not to exceed twenty million dollars, which shall draw interest, payable semi-annually, at a rate not to exceed four per cent. per annum, the proceeds whereof may be applied as the General Assembly may provide in the construction of said waterway and in the creation, equipment and maintenance of said power plants, locks, bridges, dams and appliances.

All power development from said waterway may be leased in part or in whole, as the General Assembly may by law provide, but in the event of any lease being so executed, the rental specified therein for water power shall be subject to a revaluation each ten years of the term created and the income therefrom shall be paid into the treasury of the State.

Adopted by the Senate October 16, 1907."

683 EXTRACTS FROM HOUSE DOCUMENT NO. 264, HOUSE OF REPRESENTATIVES 51ST CONGRESS, FIRST SESSION, AS FOLLOWS:

Page 5:

"The least of the two channels estimated for from Lake Michigan to La Salle is eight feet in depth below the lowest recorded stage of water in Lake Michigan and the same depth below the crests of the dams at extreme low water in the Illinois and Desplaines Rivers. This least depth of eight feet corresponds to a depth of nearly ten feet (9 feet 10 inches) across the Chicago Divide, at the mean level of Lake Michigan and eight feet below the crests of the dams in the river portions of the route, no slope being allowed for. In the canals through the line by filling the levels, a depth of nearly ten feet can be carried whenever that depth exists in the rivers. These canals, by simply raising the embankment and lock walls, can be increased to twelve feet depth at small additional expense.

In the Desplaines and Illinois Rivers the practical depths of navigation after the construction of this channel will vary with the stage of the rivers. Reckoning only to the mid-stage, which is about two and a half feet above low water from Joliet to the mouth of the Kankakee and about eight feet above low water thence to La Salle (except at Marseilles, where it is four feet above the crest of the dam), there will be in the river portions of the route from Joliet to La Salle a navigable channel varying in depth from eight feet, when the discharge of the river is a minimum, to from ten to sixteen, feet at midstages." \* \* \*

Page 6:

"A complete list of all steamboats of more than fifty tons register, navigating the Mississippi River and its tributaries, giving the dimensions of their hulls, names and tonnage, is herewith. This list is intended to embrace every steamboat, so-called, exceeding fifty tons register, that is contained in the last published (for the fiscal year ending June 30, 1888), list of 'Steam merchant vessels of the United States,' issued by the United States Government, navigating the Mississippi system of rivers from the Gulf of Mexico to their heads of navigation and includes all steamboats that at that time could have use for the proposed waterway. In this list there are but three with a greater depth of hold than nine feet. All of these have since been lost or broken up. Whether they have been replaced by smaller boats is not known." \* \* \*

Page 7:

"The largest Mississippi River steamboat that now reaches the mouth of the Illinois River in length and draught, is the St. Paul packet, 'St. Paul,' which is 300 feet long and 6 feet 2 inches depth of hold. This boat is 70 feet across her paddle-boxes and is a fair type of the largest Mississippi steamboat that will seek this route at extreme low water in the upper Illinois and Desplaines Rivers. Its net tonnage exceeds 800 tons, but larger boats exist that can use the route at extreme low water."

"A lockage at La Grange Lock is made once in eleven minutes. At this rate four lockages may possibly be made, passing as many boats, each way per hour.

Page 8:

"The extreme capacity of one of these locks which gov-

erns the capacity of the entire route as a means of transportation is, then, on the basis of boats like the St. Paul, 6,000 tons in round numbers, per hour, or 29,000,000 tons in round numbers, in 200 days, the shortest probable period of navigation, or one-half that amount if boats be moving in one direction only.

"The possible capacity of extreme low water of the channel 8 feet deep is thus more than sufficient for all probable demands upon it for many years to come. At higher stages, boats of twice the tonnage of the St. Paul could use the route." \* \* \*

Page 12:

"CHICAGO RIVER ROUTE.

"The route proposed follows the Chicago River from its mouth, via its south branch to near Bridgeport, thence via the West Fork of the South Branch of the Ogden Ditch to Summit, thence parallel to the present location of the Illinois and Michigan Canal, on lower ground, 3 miles, more or less, where it enters the bed of the Desplaines River, which it practically follows, cutting off bends to Sag Bridge where it unites with the second or  
684 Sag route.

"The route is preferred to the present location of the Illinois and Michigan Canal, or one adjacent to it.

"(1) Because it occupies lower ground, and the probable amount of excavation required is less, since the earth excavated from the old canal still remains as spoil banks to be removed.

"(2) Because the old canal is paralleled by a railroad on each side, and there is not sufficient room for the enlargement of the canal without condemning the railroad right of way and removing one or both of the tracks.

"(3) Because the present canal is the property of the State of Illinois and the conditions of transfer have not been accepted by the United States. These conditions are such that their acceptance would involve greater cost than a new right of way.

"(4) The Illinois and Michigan Canal is the main sewer of the City of Chicago, as well as a commercial highway, and cannot well be enlarged without either interfering seriously with its uses or at increased cost of work from delays due traffic upon the canal.

"(5) As a means of transportation and drainage it is



of advantage in the prosecution of the work parallel to it to maintain it in a serviceable condition during the construction of the larger canal.

“(6) For several miles of its course between Willow Springs and Lemont it is excavated in solid rock that the new route avoids so that the old canal location could not be followed in any event with advantage further than throughout the earth section.”

“SAG OR CALUMET ROUTE.

“The proposed route is via Grand Calumet River to 108th street; thence via a cut-off through Lake Calumet, to its southwestern shore; thence by another cut-off, to the Little Calumet River; thence to Blue Island, thence nearly due west via, practically, the line of the old Calumet feeder, north of Lane's Island, to the junction of the two routes at Sag Bridge.”

“PRACTICABILITY OF THE PROPOSED CHANNEL, DISCHARGE OF THE ILLINOIS RIVER, AND EFFECT OF DAMS IN THE BED OF THE ILLINOIS.

Page 20:

“The proposed channel from Lake Michigan to Lake Joliet is nearly entirely artificial; in other words, a canal. This canal, for short distances, enters the bed of the Desplaines River, and is subject to its floods throughout these short stretches. The maximum amount of this flood water to be provided for at long intervals, will probably not exceed 10,000 cubic feet per second under present conditions. The average spring freshets do not probably exceed from 3,000 to 5,000 cubic feet per second. The canal with its waste gates and weir at Lockport; the controllable sluice-gate on the dam at Joliet; the additional sluice-gates in the canal revetment below the dam and above the guard-lock at Joliet (not estimated for), taken in connection with the high retaining-walls and the allowable depth of overflow over the crest of the Joliet Dam, will safely pass this water.

“This part of the route, or the canal section, as designed, is, then, considered feasible and practicable, with the understanding that possibly a secure levee may be demanded from the dam at Joliet, along the left bank of

the Desplaines as far as to the flats below the Adams Dam,

Page 21:

to prevent overflow when the sluices at Joliet are opened to their full extent.

"The discharge over the dams above the mouth of Kankakee is not, in any case, likely to exceed from 16,000 to 23,000 cubic feet per second. Such discharge is contemplated in the constructions, and may be passed over the dams.

"There is, then, no engineering difficulty, or any apparent reason why the constructions proposed, with slight modifications that would not materially increase the estimates, will not satisfactorily subserve the purpose of a navigable channel as far as to the mouth of the Kankakee.

"Here, however, the conditions radically change. The low water discharge of the Illinois River, which below the mouth of the Kankakee and over the Marseilles Dam does not exceed 1,000 cubic feet per second, including the supply by the Illinois and Michigan Canal, increases at extreme floods, until, as indicated by the high-water marks above the crest of the Marseilles Dam, it reaches 63,000 cubic feet per second at Marseilles. This result is given by 'Francis' formula. If the velocity of approach  
685 due a slope of 2 feet to the mile, as shown by high water marks for 5 miles above the Marseilles Dam, be considered, the extreme flood discharge over the crest of the dam at Marseilles would probably be estimated at about 70,000 cubic feet per second.

"The draining of the Kankakee marshes by a cut through the rock barrier at Momence, Ind., now contemplated will certainly not lessen the ratio of 70 to 1 between flood and lowwater stage, nor will the constant discharge into the Illinois River of from 300,000 to 600,000 cubic feet per minute, contemplated by the City of Chicago for drainage purposes, lessen the flood discharge, which determines the practicability of the route for all stages.

"The dams on that portion of the route are proposed to be built as high as the topography of the valley will warrant, without extensive permanent overflow of lands or without materially increasing damage by floods, and

the depths required, where not produced by these dams in the pools above them, secured by excavation.

"These dams have their crests from 10 to 18 feet or more below the high-water plane, and at the extreme flood stage will exercise no appreciable influence over the high-water levels, slopes, and velocities. If the river be not navigable now at flood stage over the reaches named below, it will not be navigable at flood stage after the construction of the proposed works, *i. e.*, from Lover's Leap to foot of Marseilles Canal, 14 miles, for 5 miles above Marseilles Dam, and for 3 miles below the mouth of the Kankakee, where the high-water slopes are excessive; in all, 22 miles out of the 43 miles that intervene between the mouth of the Kankakee and the last dam at Utica.

Page 21:

"The route will be navigable at all stages below a stage corresponding to a discharge of from about 30,000 to 35,000 cubic feet per second, or under all ordinary conditions of the river, the extreme floods, occurring at rare intervals, and then ebbing of short duration."

"A route navigable at all times and in all conditions of the river can be obtained in four days via the valley of the Illinois River;

"(1) By canalizing past the 22 miles indicated, practically in the bed of the river, with embankment above high water mark.

"(2) By raising the dams, or by shortening the length of spillways, until the sectional area of discharge throughout the pools is much greater than the area of discharge over the dams, converting the pools into reservoirs.

"(3) By excavating and enlarging the cross sections of the pools until the same result is attained.

"(4) By constructing a lateral canal throughout the line.

Page 22:

"Any of the first three methods will involve a greater expense than would the 4th, or continuous canal from Joliet to LaSalle; the first method, because of the increased cost of the canal, with costly guard locks in connection with costly river improvement over the sections where slack water is retained; the second method, by increasing the damages by flowage of valuable lands, and by increasing the height and cost of dams and lock walls,

and the difficulty of securing the abutment and connections with the banks; and the third, by enormously increasing the amount and cost of excavation." \* \* \*

"It must be understood, therefore, that the constructions proposed herein are considered to be adequate to create a navigable water-way in the bed of the Illinois River, below the mouth of the Kankakee, at all ordinary stages of the Illinois River, but that during the short and widely separated floods the route may be found impracticable to use over the reaches named herein. Attention is invited in this connection to the report of Mr. L. L. Wheeler, which contains a short mathematical discussion of this subject.

686 "The Kankakee River brings down large quantities of heavy sediment, which has been deposited in the deeply cut trough above the rock uplift at Marseilles, until that trough of unknown depth has been filled with gravel and sand nearly to the crest of the reef at Marseilles. Under the 14-foot project, and to a less extent the 8 foot project also, the material must be excavated to get the proper depth. The present condition of the bottom of the river exhibits doubtless, the state of equilibrium that has been established between the scouring action of floods and the capacity of the heavy deposit to maintain its position. The more this condition is disturbed, or the deeper the material is excavated and the current of the river reduced, the greater will be the deposit of heavy sediment in the channel, gradually diminishing until this equilibrium is again restored.

"The Marseilles Dam will be, at high water, in practically the same condition as now, as it is proposed to get the two feet increased height of crest by a movable crest, which will be thrown down at floods. The dam below the mouth of the Kankakee and at Sugar Island will be drowned out, and practically the same condition will exist throughout the reach at high water as at present except in so far as the velocity and slope may be disturbed, however slightly, by this channel excavation. We may expect, therefore, a constant effort of the river to restore at least, its present condition by filling up the excavated channels.

"In the 8-foot project the excavation is comparatively light, but in the 14 foot project it is very heavy over this

section, and if the channel is not annually filled with heavy sediment from the Kankakee it will, at least, require constant dredging to maintain it.

"The same remark will apply to other points where there are deep excavated cuts in the river-bed, even with little diminution of velocity of current at floods, but the reach below the mouth of the Kankakee, extending to Marseilles, only will probably present much difficulty; other points to a less degree, as most of the heavier material is brought in by the Kankakee River, and will lodge in the pools below its mouth and above Marseilles Dam.

"The water available for lockage throughout the proposed line being in excess of the requirements of the system, no slope is given to the summit level, or provision made for increasing the present discharge of the Illinois River." \* \* \*

"For the section of the river under consideration, locks and dams are necessarily employed, and the nearer the system approaches slack water,

Page 23:

the nearer it approaches the best channel for navigation. As the discharge increases, the velocities of the current increase, and finally when the depth of water over the crests of the dams becomes, as the river rises, such as to allow a free discharge, the currents become difficult, or even prohibitory, to upstream navigation, as heretofore stated. The bed of the Illinois River above La Salle at several points being of such steep slope, and its discharge at high water and the variation in its discharge between high and low water so great, 70 to 1, it cannot be regarded as a very favorable stream for the application of locks and dams. The system fails at high water. Any material increase in the discharge over this section of the river, except at stages near the low water, or below the midstage, would be, then, not only undesirable, but objectionable, as far as the interests of navigation are concerned. At all times when the natural discharge of the Illinois River produces a stage obstructive to navigation over the slack watered reaches, or damaging to property interests, artificially introduced waters should be diminished in quantity to the least effective amount, or entirely cut off."

## POST AND PAUL REPORT.

*"To the Canal Commissioners of the State of Illinois:*

687 The undersigned, to whom was referred the leveling of the route and estimating the expense of constructing the contemplated canal for connecting the waters of Lake Michigan, with those of the Illinois River, in presenting their field notes and plans of the route and levels taken, have the honor to report:

That pursuant to instructions from the Commissioners, they proceeded with two companies, one to Chicago, on the shore of Lake Michigan, and the other to the rapids of the Illinois River, with a mutual understanding resulting from a cursory examination of the topography of the country made in the autumn of 1823, to confine the operations of leveling to the north side of the River Illinois and Aux Plaines, and in the valleys of those rivers. In consequence of which the party at Chicago, after sounding the lake near the shore, and sounding and meandering the Chicago River to its head (the waters of which were found stagnant and on a level with the water in Lake Michigan), proceeded leveling in the direction of the ford of Desplaines, where they crossed that stream and descended on the north side, in its valley, till the two companies intercepted each other in the front of Mount Joliette.

The object of this tour being to ascertain the inclination of an imaginary plane drawn from the surface of the water in Lake Michigan to the surface of the water, at some convenient point on the Illinois River, below the rapids, and to consider the practicability and probable expense of constructing a canal connecting those points, the undersigned have confined themselves no further to locations than merely to designate the two extreme points, the head of the Chicago River being one, and the confluence of the Little Vermillion and the Illinois being the other. The depth of the water between this point and the rapids being insufficient for the purposes of navigation, and the nature of the adjoining shores of the rivers being unfavorable for the object required, it was deemed advisable to descend to this point (a few miles below the foot of the rapids), where a convenient and safe location of the junction of the canal with the river may be had; it

being near the bluff, and having, in its immediate vicinity, but a small strip of ground, at any time, subject to inundations.

Between the two extreme points above designated, the country, particularly the vallies of the river, being generally an open prairie, the undersigned have, in the courses run, consulted expedition, but when practicable, have avoided crossing ground sensibly affected by high water.

From this general view of the plans of their operation, the undersigned draw their attention to a more detailed consideration of the various subjects connected with the object in view, and beg leave further to report :

1st. On the inclination of the planes connecting designated points on the route, and the inclination of the plane connecting the extreme points.

2d. On the rivers crossed in the route, their general character and the quantities of water furnished by each.

3d. The description and nature of the earth and rocks on the route followed.

4th. On the probable quantity of excavations, embankments and grubbing.

5th. On the number and description of aqueducts, dams and culverts that will probably be required on the different routes.

6th. On the probable number and description of locks and moles.

7th. On the probable expense of construction, including the different routes designated on the plat.

8th. On the practicability of construction.

9th. Observations and remarks.

1st. The inclination of the planes connecting the different points on the route, and the inclination of the plane connecting the extreme points.

In taking the observation to ascertain the difference of level between the points hereafter designated, the undersigned have operated with all practicable care; and in all cases where the distances between the level station and the sight poles were not exactly or nearly equal; the necessary corrections for curvature and refraction, have been made, from which it is presumable that the results herein shown may be considered very nearly approximating the truth.

The object the undersigned had in view in ascertaining



the respective levels of the points B. P. S. I. and L., noted on the plat, was to enable themselves to more satisfactorily investigate the various routes that may be formed by connecting those points, in the vicinity, and on either side of the Desplaines; then from the knowledge they possess of the intermediate country, to judge of their respective practicabilities, and probable expense of construction.

From the mouth of the Little Vermillion, the point of beginning, to L, a distance of 33 miles, 16 chains, 08 links, and 9 ms. 64 chs. 03 below the point where the route traced on the plat crossed the River Aux Sable, there is an ascent of 86 feet, 11 inches, 2-10. Here the main bluff of the Illinois disappears, having gradually settled down to the level of an extensive valley spreading out to the north and east (in which the river Aux Sables and Nettle Creeks have their courses) which is supposed to unite with a similar valley, putting out in a southwestwardly direction, from the valley of Aux Planes, near Cache Island.

From the point L to the point I, near Cache Island, is a distance of 37 ms. 47 chs. 02, and has an ascent of 67 ft. 3 in 8, consequently the practicability of an interior route, connecting those points is visibly manifest; but the quantity and nature of the cutting required to connect them can be ascertained only by careful examination and survey.

From the point I at Cache Island to the point B at the ford of the Desplaines, a distance of 18 ms. 56 chs. 60, there is an ascent of 15 ft. 0 in. 4, and the canal on the northern side of the river may be so located as to avoid, in some degree, the deep cuttings between these points. From the point B at the ford of the Desplaines, to the point C, the summit level of the country between the Desplaines and the Chicago River, or Lake Michigan, a distance of 12 chs. 28, there is an ascent of 5 ft. 8 in. lines. The point C we have denominated the summit level of the route between the ford of the Desplaines and Lake Michigan, but it is evident that by the ultimate location that must necessarily be given to the canal, the point C will also be the summit level of the route connecting the two extreme points. Then from C to A, at the head of the Chicago River, a distance of 7 ms. 40 chs. 64, there is a descent of 17 ft. 0 in. 6.

From this concise detail of results, it readily follows that the point L is 86 ft. 11 in. 2 above the water level at V, the point of beginning; that the point I at Cache Island, is 154 ft. 3 in. above the same point; that the point B at the ford, is 169 ft. 3 in. 4, above the same point; and 11 ft. 3 in. 7 above the point A at the head of the Chicago; that the summit level C is 5 ft. 8 in. 9, above the point B, and 17 ft. 0 in. 6 above the point A, or the surface of the water level of Lake Michigan; that the point A, or surface water level of Lake Michigan is 3 ft. 8 in. 7 above the point I at Cache Island; and finally that the surface water level of Lake Michigan is 157 ft. 11 in. 7 above the surface water level of the point where it is contemplated to connect the canal with the River Illinois.

Before dismissing the subject now under consideration, the undersigned deem it expedient, for the more ready comprehension of the vertical section they have presented of the traced route, to call the attention of the Commissioners to the different scales used, for without a constant attention to this point, the representation will appear quite imperfect, since the ratio of the horizontal to the vertical scale is as 1 to 165.

2d. *Rivers to be crossed, their general characters, and the quantity of water respectively furnished by each.*

In ascending from the point of beginning, passing the rear of the Buffalo Rock, a range of high perpendicular rocks on the northern margin of the Illinois River, the first stream we meet with, worth of notice, is Fox River, 14 ms. 34 chs. 84 distant from the point of beginning. This is a river of considerable magnitude; is 4 chs. 09 wide, and at its present stage, furnishes 450,000 cubic feet of water in an hour. This stream, during the period of high water, evidently expands itself beyond its first banks, and probably rises, at those times, about 20 feet above its present surface level; but as its second banks, at the points crossed by the traced route, are nearly 35  
689 feet above this surface level, and as the adjacent country presents no visible impediment to the construction of the canal toward this point, it appears practicable to cross this stream by an aqueduct extending from its second bank on one side to the second bank on the other, a distance of, say 600 feet. Although the piers necessary

to be constructed, to support the aqueduct, will obstruct the natural current of the stream, and thereby occasion a trifling accumulation of water above them, yet, as the aqueduct may be raised ten feet above the estimated rise of water, the effect of the accumulation, it is presumed, will be too inconsiderable to threaten any disastrous results. Were it desired, however, to construct a dam across this river, and on each side to connect the canal to the reservoir thus formed, it is believed that a position favorable to this view may be selected; but taking into consideration the inequable stage of the water in this, as also in all the rivers in our route, whenever it is practicable, it is most assuredly advisable, in constructing the canal, to pass the rivers by aqueduct in preference to passing them by dams. Then, should any part of the water be required to feed the canal an inconsiderable dam at some convenient point, above the aqueduct, may be constructed and the requisite supply of water drawn from the reservoir by a small side canal of sufficient capacity to convey the quantity of water required.

The next stream in our route of sufficient magnitude to claim our attention, is the river Aux Sable, 1 c 56 wide, and at its present stage, furnishes in round numbers, say 60,000 cubic feet of water in an hour. Judging from the position of the drift wood on its shores, and in the branches of the timber on its banks, it is evident that this stream, at the times of high water, rises from 12 to 15 feet above its present surface level. Here an aqueduct of about 320 feet long and 20 feet high will be required. Then by selecting a suitable position higher up the stream and constructing a dam across it, the canal may be fed by its waters, as in the case suggested by the Fox River. This river is 28 ms. 48 chs. 27 above Fox River, 43 ms. 3 chs. 11 from the point of beginning; 4 ms. 18 chs. 92 below the confluence of the rivers Desplaines and Kankakee, which form the river Illinois.

In passing from the River Aux Sable 8 mi. 31 c. 53 on our route we meet with the river Du Page a beautiful stream of water 66 feet wide, and furnishing 114,000 cubic feet of water in an hour. The maximum perpendicular rise of the water of this stream may be taken at, say 15 feet. Here an aqueduct, 320 feet long and 20 feet high will be required and a dam and side canal, for a feeder, as in former cases.

From the river DuPage, passing on 19 M. 28 c. 46, we touched the river Desplaines, at Cache Island, that river is ascertained to furnish 117,000 cubic feet of water in an hour; then 18 m. 56 c. 60 further we reach the point B at the ford of this river, which here is 3 c. 34 wide, and furnishes 72,000 cubic feet of water in an hour. From this point we proceed on 7 ms. 52 c. 92 to the head of the Chicago River, on narrow arm of Lake Michigan, 5 m. 2 c. long; a natural canal, averaging say, 2 c. 50 in width, and having at no place between the bar at its entrance into the lake and its head, less than 12 feet of water.

It must be observed that as the above results are predicted on the present stage of water, and as the quantities, at different periods, is considerably variable, and may probably, at some times be lower than at present, it is advisable, that on the route which may be selected by the commissioners, the results should show a surplus of water sufficient to answer this probable depreciation.

690 3d. *The description and nature of the earth and rocks on the route traced on the map.*

From the cursory examination the undersigned have been able to give on the subjects embraced under this head, having been limited to a passing view of the mere surface of the route, and the broken sides of ravines which occasionally presented themselves, they are fully sensible that they here offer to the Commissioners a very imperfect sketch of the varieties of the earth, soil, pebbles and rocks that would be met with in a deliberate, scientific examination of this section of the country.

The earth in some of the small valleys is alluvian and in others gravel and sand, apparently washed from the neighboring bluffs, or adjoining ridges. The ridges present some varieties; many of which, especially in the middle and upper part of the route, are sand and gravel; others are loam with occasional strata of clay; and the sides of the ravines frequently exhibit argillaceous appearances, and in some instances, assumes a slaty texture; but considering the earth, en masse during the entire route, it may be considered of a quality favorable to excavation. On the greater part of the distance there are, in the valleys of the rivers, loose rock of various sizes, from those of a finger stone to those of several tons

weight, promiscuously scattered over the surface. In several parts of the route, especially in the vicinity of the Fox River, ledges of rock make their appearance, but in ultimately locating the canal the greater part, if not all these visible ledges, may be avoided; but as the base of the country, from the foot of the rapids of the Illinois to the ford of the Desplaines is probably rock, it is presumable that wherever the canal may be located, in the requisite excavations, ledges of rock will intercept the line and present themselves to view above the bottom of the canal, hence in estimating the probable expense of excavation, this supposition should be duly regarded.

The principal ingredient in the composition of these rocks, especially those in the ledges, is sand; some, however, are silicious and very hard, which is almost invariably the case with these loose stones on the surface, some are calcareous and some are apparently pure sand, and are readily decomposed by the light stroke of a hammer. In the vicinity of Fox River, and between that stream and the coal bank, there are several of those ledges, and on the surface we observed frequent clusters of stones apparently thrown together by art, having a considerably thick coat of calcareous substance, containing a perfectly silicious nucleus. In the bluffs of the Illinois about one mile and a half below the Little Vermillion is, to all appearances, an extensive body of gray limestone, and in the bluffs of the Desplaines, above Mount Joliette, large quantities of similar stone are exposed to view. At several other intermediate points we discovered a species of calcareous sandstone, tolerably hard, granular in their texture, and will probably make lime, but of very inferior quality. However, from the ledges of grey limestone above noticed, and from the bed of the limestone, near the bank of the Chicago River, from which the inhabitants in that section of the country obtain their supply of this article, it is supposed a sufficient quantity of lime and building stones may be procured for the construction of the locks that may be required on the canal.

4th. *The probable quantity of excavations, embankments and grubbing on the different routes.*

What the undersigned denominate *difference routes*, are the variations which may be given to the upper part of the route lying between the head of the Chicago River

and the point in the River Desplaines, near the head of Ile a la Cache or Cache Island. From this point to the mouth of the Little Vermillion, all the routes are the same, excepting in that from A to H, by which it is contemplated to use the water of Lake Michigan alone for a  
 691 feeder. By this route, after passing the Desplaines by an aqueduct at H the canal will communicate with the principal line at K, and thence proceed to the mouth of the Little Vermillion. To avoid tautology and circumlocution in our subsequent observations, relative to the variations here indicated, we will denominate the route from the head of the Chicago by the ford of Aux Plaines to B, and thence by K, to be the *first route*; that from A to P, thence along the bed of the river to Cache Island, and thence to I, K, &c to be the *second route*; that from A to S, thence in the bed of the river to Cache Island, and thence by I, K &c to be the *third route*; that by A to Cache Island, I, K &c to be the *fourth route*; and that from A to H, K &c to be the *fifth route*; by taking the *first route* the whole line of the communication must be formed by dams, aqueducts, excavations and embankments. Now, if we suppose 1-10th of the distance, or ten miles, to be embankments; 1-30th of it, or three miles, excavation in rock (which is supposed in each case to be a liberal allowance) and 1320 feet of aqueducts, and 500 feet dams, the remaining part of the distance will fall on ground easily excavated. Then by assuming the activity and declivity of the surface to be equable, a supposition that may be nearly realized in the ultimate location of the canal, it is believed the deep cuttings that will be absolutely required, will be compensated by supposing the whole capacity of the canal, to-wit, 40 feet wide at top, 28 feet wide at bottom, and four feet deep to be excavated. The small quantity of timber to be met with, on the route traced on the map, all lying below the diverging lines at Cache Island, the quantity of grubbing, in all cases here considered, will be the same, which we suppose to be in all five miles.

Assuming the above estimates as data, the whole line being 97 ms. 2 c. 62, we have on this route,

Excavations in earth	83 ms. 58 c. 26
do in rock	3
Embankments	10
Grubbing	5

This route supposes a canal, from the ford of the Desplaines to the head of the Chicago, to be supplied from the water of the Aux Plaines, excepting what may be drawn to it from the small lake called the Lac de la Pointe Aux Chenes, or Oak Point Lake, lying near the summit level of the route. This lake is supposed to be supplied from water from the springs in the marshy ground around it, and as it is higher than the water of the Chicago, no difficulty exists in using its water to feed the canal. Then the other part of the route, as far down as the River Du Page, must necessarily be supplied by the water of the Aux Plaines above the ford, and such as may be drawn to it from the spring brooks in the route.

By taking the *second route*, the distance from P to Cache Island, 18 ms. 56 c. 60, will be in the bed of the river, in which 100 feet of rocks, lying in stagnant water, must be removed; then deducting from the distance from P to Cache Island from the distance of earth to be excavated, we have for this route,

Excavation in earth, 65 ms. 1 c. 66

The excavation in rock, embankments and grubbing, the same as before. In this route, the canal between the head of the Chicago and Aux Plaines may, more evidently than in the former case, be fed by the small Lac de la Pointe Aux Chenes.

By the *third route*, the distance from A to S, just above the Saganashkee, must be excavated, and that part of the canal supplied from the river Desplaines and the waters of the lake of the Saganashkee, in the immediate vicinity of that part of the canal. From this point to Cache Island, the bed of the river will be followed 9 m. 32 c. 60. Deducting this distance from the whole extent of the excavation in earth, we shall have on this route.

Excavation in earth, 74 ms. 25 c. 66

692 The excavation in rock, embankments and grubbing, the same as before. Supposing this route to be taken, the same 100 feet of rock in the bed of the river, mentioned in the last route, must be removed, in order to insure a ready and safe passage for boats at all stages of water.

By the *fourth route*, we have the same extent, of excavation as in the first, however, it is probable, that in this the digging will be easier but more deep cutting than in the first route, consequently estimating it the same, we have for this route the same results as for the first.



This route supposes the water to be drawn from Lake Michigan, and at the head of Cache Island, where the surface water level is 3 ft. 7 in. 7, below the surface water level of the lake, to mingle with those in the reservoir formed by the dam at this place. On this supposition, the excavation will naturally form an artificial river between the head of Cache Island and the lake, which will alternately flow from and to the lake, as the waters in the River Desplaines may be low or high. In this route it will be observed that the digging will necessarily pass through the marsh of the Saganashkee, or British Swamp. of Lake Michigan alone to supply the canal, in consequence of which it will be necessary to continue it on the south side of the river till the river has acquired a sufficient descent to enable the canal to be carried over it by an aqueduct which will be at a point about eight miles below Cache Island. This aqueduct, it is supposed, will be about 500 feet long and 30 feet high; hence, on this route also we will have the same excavations, embankments and grubbing as in the first, together with the additional expense of the aforesaid aqueduct. But all the dams required on the other routes may be dispensed with on this.

*5th. The number and description of aqueducts, dams and culverts that will probably be required.*

Whichever of the above mentioned routes may be selected by the Commissioners, it is supposed that the final location of the canal may be such as to avoid the greater part of the deep ravine to be met with on, and in the immediate vicinity of, the route leveled; in consequence of which, and on the supposition that a number of culverts may be taken in the ratio of two to each mile, we shall have, for the first route,

Aqueducts at Fox River, say	600 feet long, 30 feet high
ditto at Aux Sables	360 ditto 20 ditto
ditto Du Page	360 ditto 20 ditto
Dam at B. on Aux Plaines	300 ditto 4 ditto
“ “ Aux Sables	100 ditto 4 ditto
“ “ Du Page	100 ditto 4 ditto
Culverts, say	200

By the *second route*, we shall have the same aqueducts, and the same number of dams as above, except the dams across the River Desplaines, in the place of being at the

ford, will be at the head of Cache Island, and the number of culverts will be say, 162.

By the *third route*, the aqueducts and dams will be the same as in the second route, but the number of culverts will be say, 174.

By the *fourth route*, the aqueducts and dams will be the same as in the former case, but the number of culverts will be say, 142. This supposes no culverts from Cache Island to the Chicago.

By the *fifth route*, in addition to the aqueducts supposed for the former routes, respectively, we shall have one at the Little Rock, on the River Desplaines, 500 feet long and 30 feet high. On this route all the dams, as before observed, may be dispensed with, and the number of culverts will be the same as in the first route, which was estimated at 200.

693    *6th. The probable number and description of locks and moles.*

It has already been observed that from Cache Island to the mouth of the Little Vermillion, there is a descent of 154 ft. 3 in.; that from the ford of the River Desplaines to the same point, there is a descent of 169 ft. 3 in. (4); that from the ford to the head of the Chicago River, there is a descent of 11 ft. 3 in. 7; that from the head of the Chicago River to the Little Vermillion, there is a descent of 157 ft. 11 in. 7; and from the head of the Chicago River to the Cache Island, a descent of 3 ft. 8 in. 7; hence, by the first route we have the ascent of 169 ft. 3 in. 4, and a descent of 11 ft. 3 in.; giving an aggregate of 180 ft. 7 in. 1. Now, observing the small inclination of the planes of the ascent and descent, and reflecting on the general uniformity and equability of the surface of the country, it is supposed the intermediate locks may be located at very nearly equal distances from each other, in consequence of which the maximum inclination of the bottom of the canal should not, on any account, exceed one inch in a mile. Assuming this maximum as a datum, we shall have on this route, 172 ft. 6 in. of lockage, exclusive of the entering lock at the lake, should that be eventually desired, and such guard locks as may be necessary. From these results it follows, that on this route there

must be 22 locks of 7 ft. 10 in. one lift each, and probably 11 guard locks.

These guard locks will be located as follows: one on each side of the contemplated dam at the ford; two at the supposed feeder from the lake of the Point Aux Chenes; two at the proposed feeding canal at the River Du Page; two at that of the River Aux Sable; and, say three small ones at the spring brook whose waters may be required to feed the canal between the ford and the Du Page; and if it should be found necessary, two others at a feeding canal from Fox River; however, it is believed that these will never be required.

By the *second route*, we have an ascent from the Little Vermillion to Cache Island of 154 ft. 3 in., and from the point P to the head of the Chicago a descent of 11 ft. 3 in.; giving an aggregate of 165 ft. 6 in. Then, assuming the same inclination for the bottom of the canal as in the former case, there will result in ascent and descent 157 ft. 5 in. of lockage, giving as follows:

20 locks of 7 ft. 10 in. 4 and probably eight guard locks.

These guard locks will be located as follows: one at the River Desplaines at P; two at the supposed feeder of the lake Point Aux Chenes; one on the north side of the reservoir at Cache Island and from this to the lower end of the route the same guard locks as mentioned from the Du Page to Fox River inclusive.

By the *third route*, we have at Cache Island an ascent of 154 ft. 3 in. and from S to the head of the Chicago, a descent of 11 ft. giving an aggregate of 165 ft. 3 in. Then, assuming as before, for the inclination to be given to the bottom of the canal, we shall have an ascent and descent 157 ft. 2 in. of lockage and consequently,

20 locks 7 ft. 10 in. 3 lifts each, and probably 8 guard locks.

In this route the guard locks from the Cache Island to Fox River, inclusive, will be the same as in former cases, but for the upper part of the route we shall have a guard-lock at S, on the Desplaines River, and one, or probably two, for the feeding canal, from the Lake of the Saganash-kee.

By the *fourth route*, we have the ascent to the Chicago equal to 157 ft. 11 in. 7—deducting from this 3 ft. 8 in. 7, the ascent from Cache Island to the Chicago, we have 154

ft. 3 in. for the ascent to Cache Island, as before shown, consequently, on this route, making the same assumption for the inclination of the canal, as before, we shall have 140 ft. 3 in. of lockage, which will require,

10 locks of 7 ft. 10 in. 6 lift each—and probably five guard locks.

In this case, it is probable that all the guard locks required will be those already designated on the routes between Cache Island and Fox River, inclusive. Should any others be required, they will evidently be located as follows: one at the head of the Chicago River, and one on the south side of the reservoir at Cache Island.

694 By the *fifth and last route* considered, the entire ascent, as before, is 157 ft. 11 in. 7, which, supposing the inclination of the canal as in the former cases, will give 149 ft. 10 in. 7 of lockage, and require,

19 locks of 7 ft. 10 in. 6 lift each.

Adhering in this route to the supposition of obtaining from Lake Michigan the entire water supply to be used, it is probable that all the guard locks required will be one at the head of the Chicago River, and if required and found practicable to construct, another in the Saganash-kee.

In all the routes above suggested, the horizontal plane of the lift locks are supposed to be the same; for example:

Length 76 feet

Breadth 14 ditto at each end,

having a batter on each side of the lock of half an inch in each foot perpendicular height;

The horizontal section of its sides being extremely flat elliptical arches nearly approximating right lines, the chords being respectively 76 feet, and each fleche  $\frac{1}{2}$  of an inch for each perpendicular foot of the height of the lock. Such is the plan of the principal locks on the New York Grand canal. This peculiar construction being adopted, without doubt to give more strength to the sides of the locks, and, thereby to enable them to more effectually sustain the lateral pressure of the adjoining earth. But on the supposition of the cavities being left, or substantially occurring in the rear of the masonry, this precaution to acquire strength and give stability to the lock would absolutely weaken it, and leave its sides more exposed to the pressure of the water in its chamber, than

would be experienced by having the walls of the chambers straight and perpendicular. The effect of the elliptical form and batter of the side of the locks has been experienced in the canal of Languedoc, and subsequently avoided in the straight and perpendicular sides given to the chambers of those given in the canal of Picardie, in the Gravilines, and in many others constructed on the continent of Europe. Another and very important advantage possessed by the locks with straight and perpendicular sides, is the additional facility, and reduction of expense attending their construction; a consideration at all times, where absolute utility, instead of ornament is consulted, worthy the most serious attention.

The next subject claiming investigation is the manner in which a convenient and sure entrance may be had into Lake Michigan. On this point there has been considerable diversity of opinion expressed by persons visiting the place; some of whom, on examination of the sandbar formed by the operation of the surf of the lake in front of the mouth of the Chicago River, have considered the formation and continuance of a navigable inlet into the river, to be a hopeless task, the prevailing winds having a tendency to accumulate sand on that shore; but reflecting on the improvements, from time to time, made in the harbor of Dunkirk, as a particular example, the reflecting mind will readily assent to the practicability of the achievement.

To ascertain the probable expense of effecting this object, the undersigned have sounded the lake sufficiently far from the shore to obtain a depth of 15 feet of water which is supposed to be sufficient for any of the vessels navigating the lake. Influenced by the result of these observations, the undersigned recommend to the consideration of the Commissioners the construction of a double mole, or wharf, such as are constructed on the shores of our seaport towns, having a space between them of, say 40 feet wide, for the passage of vessels from and to the lake, as shown on the sketch of that harbor herewith presented. The exterior part of this mole, or the part between the sandbar and the point in the lake where the requisite depth of water is obtained, should be 40 feet at the bottom, 20 feet at top, and 20 feet high. The interior part, passing through the sandbar and en-

695 tering the Chicago River, may be 20 feet at bottom, 10 feet at top, and 20 feet high. Then, as the exterior distance is 18 chains, and the interior 8 chains, we have, for the entire contents, 371,360 cubic feet, which computed at the rate of 6½ cents, the cubic foot, will give \$54,460 for the expense of construction.

Again, if we suppose the whole interior distance of 8 chains long and 20 deep, to be excavated, we shall have to remove 15,644 cubic yards, which computed at 10 cents the cubic yard, will amount to \$1,564.40; or, say, in round numbers, that the mole completed will cost \$57,000. This project once effected, the Chicago River, for five or six miles in length, will afford one of the finest and most secure harbors in the world; for here vessels, drawing from 15 to 20 feet of water may ride perfectly secure from the destructive effects of storms and tempests. In locating this projected mole, on the sketch of the harbor, the undersigned have been governed by the direction of the prevailing winds on that lake, and, consequently, to secure its entrance from the severity of those winds have given it the oblique direction there shown.

7th. *The probable expense of construction, including the different routes designated on the plat.*

The Commissioners will be aware, that in the estimate here presented of the probable expense of constructing the contemplated canal, considering the present stage of operations, merely approximate values are to be supposed; for *absolute correctness* cannot be expected, even after the final location, nor until it shall have been entirely completed. However, the undersigned, in obtaining these results, have duly compared and deliberated on both the propitious and adverse features which their operations and cursory examination of the country have presented to them in relation to the object in view, and have thence drawn the data used in their computation.

From the preceding investigation, we obtain, for the first route, as follows:

Excavation in earth 2,217,017 cubic yards a 10 ct	\$221,701.70
Excavation in rock 79,875 cubic yards a 50	39,937.59
Embankment 265,950 cubic yards a 18	47,851.00
Three aqueduct (stone piers and trunk of wood) 1,320 linear feet a \$50	66,000.00
Three dams in all 500 linear feet a 7	3,500.00
22 locks, of 7 ft. 10 in. 1 lift each a \$1,000 per ft.	172,500.00
11 guard locks (average value \$2,500)	27,500.00
Mole at Chicago	57,000.00
200 culverts a \$200 e	40,000.00
Grubbing five miles a \$1,200 per mile	6,000.00
Sum	<hr/> \$682,010.20
Contingent expenses, say 5 per centum	34,100.51
Total amount	<hr/> \$716,110.71

For the *second route*, supposing the excavations on rocks, the embankments, aqueducts, dams, mole and grubbing to be the same in the above, there will remain to be deducted from the net amount there shown, the following sum, to-wit:

Excavation in earth 502,385 cubic yards a 10 cts	\$50,238.50
15 ft. 1 in. of lockage a \$1000	15,083.33
Sum	<hr/> \$72,921.83
Estimate of first route	\$682,010.20
Deduct the above sum	72,921.83
Remainder	<hr/> \$609,088.38
Add for contingencies 5 per cent	30,454.41
Probable cost of second route	<hr/> \$639,542.78

For the *third route*, making the same supposition as in the last case, there will remain to be deducted, from the estimate of the first route, as follows:



696 Estimate for the first route		\$682,010.20
Deduct for excavations in earth		
250,105 cubic yards at 10 cts	\$25,010.50	
Deduct lockage of 15 ft. 4 in. at		
\$100	\$15,333.33	
26 culverts at \$200	5,200.00	45,543.83
		<hr/>
		\$636,466.37
To this add 5 per cent. for contingencies		31,823.31
		<hr/>
Probable expense of third route		\$668,289.68
For the <i>fourth route</i> , take the estimate of		
the first route		\$682,010.20
From which deduct for		
6 guard locks of \$2,500 each	\$15,000	
58 culverts a 200	11,600	
24 ft. 3 in. lockage a \$1000	24,250	50,850.00
		<hr/>
Remainder		\$631,160.20
Add for contingency 5 per cent		31,558.01
		<hr/>
Probable cost of fourth route		\$662,718.21
For the <i>fifth route</i> , take the estimate of the		
first route		\$682,010.20
To this add for one aqueduct 500 feet long		
\$25,000		25,000.00
		<hr/>
Sum		\$707,010.20
From this deduct for		
22 ft. 7 in. 3 of lockage a \$1000	\$22,608.33	
10 guard locks a \$2,500	25,000.00	
3 dams 500 ft. a 7	\$3,500.00	51,108.33
		<hr/>
Remainder		\$656,901.87
Add for contingencies 5 per cent		32,845.09
		<hr/>
Probable cost of the fifth route		\$689,746.96
That is, the probable expense of the first route		
will be		\$716,110.71
second route		639,542.78
third route		668,289.68
fourth route		662,718.24
fifth route		689,746.96

8th. *The practicability of construction, including the different routes.*

The only requisite to insure the practicability of effecting a canal navigation over any section of the country, is a competent supply of water on the summit level of the desired route. The competency of water, on the summit level, being an indispensable condition in the successful construction of canals, it remains for us to examine which it can be obtained in either, or on all of the respective routes herein suggested.

On the first route the entire demand to supply the canal from the head of the Chicago River to the River Du Page, must be drawn from the River Desplaines at the ford, from the Lake De la Point Aux Chenes, and from such spring brooks as lie in the route between the ford and the Du Page.

In the first place, assuming the dimensions of the locks as above shown, to-wit: 76 feet long and 14 feet wide, having straight and perpendicular sides, and supposing the canal to be full, the passage of each boat will require 8,512 cubic feet of water; then, if we suppose the time required for filling and discharging the lock and passing the boat to be 15 minutes, we will require for both branches of the canal, emanating from the reservoir at the ford, 68,096 cubic feet in an hour. To this expense must be added the water lost by evaporation, leakage and absorption. Now, the distance from the Du Page to the ford being 38 ms. 05 c. 06, and from the ford to the head of the Chicago, being 7 ms. 52 c. 92, giving an aggregate of 45 ms. 57 c. 98, and the canal being supposed 40 feet wide at the surface of the water, we shall evi-  
697 dently have a surface of 9,657,067 square feet of water exposed to the action of the sun and atmosphere.

From this surface, agreeably to the average of experiments, there will each hour be dissipated by evaporation, 3,212.3 cubic feet. Then, if we suppose the like quantity to be lost by leakage and absorption, we shall have for an hourly aggregate demand 74,520.6 cubic feet.

Now, as the Desplaines River has been ascertained to furnish in each hour 72,000 cubic feet, and if we add to this 1,000 cubic feet which the lake de la Pointe Aux Chenes is supposed capable of furnishing in an hour, and 22,500

cubic feet which it is supposed may be drawn from spring brooks, to be met with on the route, between the ford and Cache Island (it being half the accession being found between those two points) and 6,000 cubic feet receivable from other small streams, between Cache Island and the Du Page, we shall have an hourly fund of 101,500 cubic feet, hence the probable hourly surplus of water on this route may be estimated at 26,980, or in round numbers say 27,000 cubic feet. It must be observed that these estimates are predicated on the supposition that boats are passing and repassing in as rapid a succession as practicable, a supposition which should, indubitably, obtain when we seek for general results and maximum effects. The distance above determined is the only part of the route on which the least apprehension of deficiency of water can exist, for the Du Page, furnishing 114,000 cubic feet and 8 ms. 31 c. 53 below it the Aux Sable furnishing 60,000 cubic feet in an hour, all of which is subject to the use of the canal, gives positive assurance of an abundant supply for the remaining part of the route.

By the second route, we commence with the quantity of water furnished, in an hour, by the River Desplaines at Cache Island, 117,000 cubic feet, and to this add the 1,000 feet an hour supposed obtainable from the Lac de la Point Aux Chenes, and 6,000 cubic feet from the springs above Du Page, as before, which gives an hourly aggregate fund of 124,000 cubic feet. Assuming the evaporation, embrace objects of greater importance), are for the purmer route, and computing the quantity required for the upper part of the route to be 34,048 cubic feet an hour, there will remain, subject to the demand of the route lying between Cache Island and Du Page an hourly fund of 83,479 cubic feet. Now, this demand was supposed to be 34,048 cubic feet, consequently, on this route there will remain an hourly surplus of 49,527, say 49,000 cubic feet for that part of the canal above the River Du Page, below which, as before shown, there is the greatest abundance.

By the third route we have the same quantity of water as in the second, with what may perhaps be obtained from the Lake of Saganashkee, which we will suppose to be 3,000 cubic feet in an hour. Then suppose the demand, in all respects to be the same as in the former

cases, there will remain on the route above the Du Page, an hourly surplus of say 52,000 cubic feet.

By the fourth and fifth routes, the first of which supposes the canal to be supplied both by Lake Michigan and the River Desplaines, and the second by Lake Michigan alone, all desirable quantities of water are at command; but relative to the entire practicability of constructing a canal on either side of these two routes, the undersigned cannot hazard an opinion without previously examining, with more care than they have yet been able to, the country in the vicinity of the Saganashkee; for the only apparent objection to either of them emanates from the probable necessity of passing through the lower end of it. If this swamp cannot be avoided by some circuitous route, the difficulty and expense of constructing a canal through it, will in all probability, be very great; and even then, since this point is, say 10 feet higher than Lake Michigan, success in preserving the canal from inundation and imminent danger of destruction from the high water of the swamp and its lake, will be extremely doubtful.

*9th. Observations and remarks.*

- 698 By the preceding estimate, omitting, as will be noticed in the estimates of the two last routes, the additional expense that would be necessarily incurred in crossing Saganashkee, the average cost per mile, of the several suggested routes will be nearly \$7,000. Comparing this with the cost of other canals particularly the Middlesex Canal, which absolutely cost, exclusive of the land through which it passes, \$13,374 per mile, and the New York Canal, by estimation \$10,500 per mile, as also with others in Europe, the expenses of which have been enormous; and, at the same time considering the relation of object effected by many of those already constructed, and to be effected by that now in contemplation, the mind is forcibly impressed with its great importance, and with peculiar pleasure rests on the period when a canal navigation between Lake Michigan and the Illinois shall have been achieved.

Many and, indeed we may say, nearly all, of the canals that have been constructed, except those in the State of New York (the ultimate effect of which are destined to embrace objects of greater importance), are for the pur-

pose of facilitating the communication along an accustomed highway; opening to commerce no new field—giving to agriculture no new excitement; but in relation to the intercourse between the Illinois and Lake Michigan the case is widely different. Here the canal will not only furnish a safe and expeditious mode of conveyance between two important points, but to open the western states a new and additional market, and, by the reciprocal advantages afforded excite their citizens to industry and enterprise. It will, in truth be adding one of the most important links to the American commercial chain, which must, by its effects, bind together the respective interests of the Atlantic and western states; consolidate the commercial and political policy of the most distant parts of the Union, and give to the patriot a grateful theme.

The western states, separated from the eastern by the Allegheny Mountains, are confined to New Orleans alone for a market for the immense surplus of produce they do and may supply, much of which is liable to almost immediate injury from the humidity and heat of the atmosphere of that climate. Long has this cheerless prospect been to the farmers of the west, and long have they anxiously looked for an era more propitious. That this desideratum may be realized; that a new and advantageous market may be opened for the various productions of this fertile region, and that we may, by the artificial direction given to the waters of our lakes and rivers, reciprocate with others the advantages derivable from commercial intercourse, the preceding detail of results authorize the presumption.

All of which is respectfully submitted.

JUSTUS POST  
R. PAUL

Vandalia, December 25, 1824."

699 LIST OF VARIOUS DOCUMENTS USED BY THE WITNESS LYMAN E. COOLEY IN THE PREPARATION OF THE CONSOLIDATED PROFILE COOLEY EXHIBIT 3, AS FOLLOWS:

Cooley Exhibit 21—Profile of United States survey of 1902-4.

Cooley Exhibit 22—Sheet 55, accompanying the foregoing profile.

Cooley Exhibit 23—Sheet 56, accompanying said profile.

Cooley Exhibit 24—Sheet 57, accompanying said profile.

(Note: The witness indicated that Sheets 11 and 12 in House Documents 263 of 1905 embrace the material Cooley Exhibits 22, 23 and 24; said Sheet 11 was marked Cooley Exhibit 22a, and said Sheet 12, Cooley Exhibit 23a.

Cooley Exhibit 25—Sheet 13, Marshall's survey of Waterway from Lake Michigan to the Illinois River of 1890, being duplicate of Zarley Exhibit and the sheet used in cross-examination of witness Mills, containing marks put thereon during said cross-examination.

Cooley Exhibit 26—Sheet 15 of Benyeaurd survey of 1893.

Cooley Exhibit 27—Sheet 16 of foregoing.

Cooley Exhibit 28—Sheet 2 of plans of dam, May 20, 1908.

Cooley Exhibit 29—Map and profile of Desplaines and Illinois Rivers, Lockport to Henry, by the Sanitary District of Chicago.

Cooley Exhibit 30—Profile Lake Michigan to Cairo, Sheet No. 1, by the Drainage District of Chicago.

Cooley Exhibit 31—(Previously put in evidence as Cooley Exhibit 15.)—The Seddon profile, showing flow lines of Desplaines and Illinois Rivers between Joliet and LaSalle.

Pages 189 to 192, inclusive, of House Document 263, 59th Congress, First Session, 1905, containing data of discharge, measurements of Illinois and Desplaines Rivers.

Pages 478 to 520, inclusive, of said House Document 263.

Cooley Exhibit 32—Gauge readings of the Desplaines River at Riverside for the year 1905, taken from the Proceedings of the Sanitary District of Chicago, that year.

Cooley Exhibit 33—(Previously introduced as Cooley Exhibit 13; Trans., p. 7642; Abst., p. 876.)—Pages 944 to 962, inclusive, Proceedings of the Board of Trustees of the Sanitary District of Chicago, November 27, 1907.

Cooley Exhibit 34—Gauge readings, Riverside gauge, 1907, from Proceedings of Sanitary District of Chicago.

Cooley Exhibit 4—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1900.

Cooley Exhibit 5—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1901.

Cooley Exhibit 6—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1902.

Cooley Exhibit 7—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1903.

Cooley Exhibit 8—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1904.

Cooley Exhibit 9—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1905.

Cooley Exhibit 10—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1906.

Cooley Exhibit 11—Tabulation of flow in main channel, by Sanitary District of Chicago, for the year 1907.

Cooley Exhibit 35—Original profile of Desplaines and Illinois Rivers, by General J. A. Wilson, 1867.

Cooley Exhibit 36—Original profile of Desplaines and Illinois Rivers, by Colonel J. A. Macomb, 1874.

Profile Sheets 7 and 8, House Document 192, 54th Congress, Second Session, Report of Deep Waterways Commission.

Title page of said book is as follows:

“Report of the United States Deep Waterways Commission, prepared at Detroit, Michigan, December 18-22, 1896, by the Commissioners, James B. Angell, John E. Russell, Lyman E. Cooley. Accompanied by the report on Technical Work and the Several Topical Reports and Drawings pertaining thereto. January 18, 1897.—Referred to the Committee on Interstate and Foreign Commerce, with accompanying papers, and ordered to be printed. WASHINGTON: Government Printing Office. 1897.”



700 OFFICIAL REPORT OF THE SANITARY DISTRICT ON THE LAKES TO THE GULF WATERWAY OF 1890 AND 1891, PAGES 3 AND 4 AND PAGES 8 AND 9, AS FOLLOWS:

“HISTORICAL RESUME.

1. FIRST THOUGHT OF A WATERWAY.—Great navigable rivers, separated by a short and low portage, the favorite trail of the Indian and the trapper, guided the first explorers, Joliet, Marquette, LaSalle and Hennepin, whose names are memorialized in the geography of the route. The possibilities which dawned on these early visitors appealed to the pioneer until the ‘Chicago Portage’ was better known to statesmen a hundred years ago than to those of today, better known in an era when water transportation was the great instrument of commerce.

2. EARLY CONSIDERATION, 1808-1838.—Albert Gallatin, in his celebrated report of 1808, on means of internal communication, gave a prominent place to the project of a ship canal across this portage, and in 1811 it was reported in Congress in a bill along with the projected Erie and other canals. From 1808-1825 Clinton and Morris urged the ‘proposed ship canal’ as an extension of the Erie Canal to the Mississippi, thus opening up water communication by the lakes from the Hudson River to the Gulf. In 1838 General Dearborn writes of the canal as ‘of such enlarged dimensions as to permit the passage of large vessels, being ten feet deep,’ or all that could then be carried by lake across the St. Clair flats. The navigable waters of the Desplaines, as reserved for public use by the original land survey (made in 1821) approached at Summit within seven miles of the waters of Lake Michigan, at the South Branch of the Chicago River at Bridgeport.

3. EARLY SURVEYS. The first surveys appear to have been made by Capt. Long in 1816, and the United States passed its first act in 1822, and legislated farther in 1827, 1833, 1842 and 1854. The State of Illinois took action in 1823, authorized canal construction in 1829, and inaugurated the work in 1836. The State submitted plans in 1825, a survey was made by ‘the United States in 1830, and further surveys by the State in 1833.

4. CANAL VERSUS RIVER: CANAL CONSTRUCTION.—The question of canal or slackwater (locks and dams in the river) between LaSalle and Joliet was in controversy, and with the present it can be said was wrongly decided in favor of the canal. The work was prosecuted under various financial vicissitudes, and finally opened in 1848 on a modified plan, with summit level across the 'Chicago Divide' eight feet above low lake level and supplied from the Calumet River by a feeder through the Sag, a side branch of the ancient outlet leading out by Blue Island. This summit level was finally cut down to lake level, according to the original plan, in 1866-1871, by the City of Chicago for sanitary purposes, thus fulfilling in a minor degree the dream of two hundred years, a flow of water from the Great Lakes to the Mississippi.

### III. THE POLICY OF THE STATE AND THE SANITARY DISTRICT.

1. State Legislation. The policy of the State of Illinois and of the Sanitary District of Chicago is defined in the legislation by the General Assembly of 1889, viz.:

1. An act to create Sanitary Districts and to remove obstructions in the Desplaines and Illinois Rivers. Approved May 29, 1889. In force July 1, 1889.

2. An act in reference to the improvement of the Illinois and Desplaines Rivers, and to repeal an act entitled, 'An Act to cede certain locks and dams in the Illinois River to the United States. Approved May 31, 1887. In force May 31, 1887.' Approved June 4, 1889. In force, July 1, 1889.

Joint resolution defining the policy of the State in regard to a waterway of the greatest practicable depth and usefulness for navigation from Lake Michigan via the Desplaines and Illinois Rivers, and to encourage the construction of feeders thereto of like proportions and usefulness:

2. Organization of the Sanitary District. This policy was further defined and the laws given a practicable bearing by the petition for a sanitary district, the decision of the three judges acting as a commission to determine the boundaries of said district, and the vote of 80,000 electors against less than 200, by which the Sanitary District of Chicago became an accomplished fact.

3. Statement of Policy. The policy thus defined may be epitomized as follows:

1. To construct a waterway of a capacity of not less than 10,000 cubic feet per second (600,000 cubic feet per minute) from Lake Michigan at or near the Chicago River across the Chicago Divide of a width of not less than 160 feet and of a depth of not less than 18 feet, to some point on the Desplaines River where the water may be released to the public river anywhere between Lockport and Lake Joliet. The joint resolution in contemplation of co-operation by the United States, specifies the depth at not less than 22 feet to Lake Joliet.

2. To secure a depth of not less than 14 feet from Lake Joliet to LaSalle.

3. To so design the works from Lake Michigan to La Salle as to permit further developments for any additional capacity and for a depth from Lake Joliet to La Salle equal to that across the Chicago Divide.

4. To remove the state works at Henry and at Copperas Creek, on the lower Illinois, within four years or sooner, if accession of water will permit, and to stop work upon the Government locks and dams at La Grange and Kampsville, and to improve the lower river from La Salle to the mouth in such manner as to develop progressively all the depth practicable by the aid of a large water supply from Lake Michigan at Chicago.'

4. Work of the Sanitary District. The Sanitary District is obligated to construct a channel not less than 18 feet deep and of not less than the specified capacity across the Chicago Divide and may deliver the water to the public river at any point between Lockport and Lake Joliet." The preface of said book reading as follows:

"To the Board of Trustees of the Sanitary District of Chicago.

Gentlemen:—

I submit herewith a preliminary report which is designed to cover the issues involved in a waterway from the Great Lakes to the Gulf of Mexico, and the relations which such waterway may bear to the Sanitary District of Chicago.

(Signed) L. E. COOLEY,  
Chief Engineer.

Chicago, August, 1890."

702 ABSTRACT OF LEASE BY THE ILLINOIS AND MICHIGAN CANAL COMMISSIONERS TO HENDERSON HOWK AND JOHN B. PRESTON OF DAM NO. 1, JULY 17, 1855, EXTENDED TO JULY 15, 1916, AS FOLLOWS:

“Trustees of the Illinois & Michigan Canal  
to  
Henderson Howk and John B. Preston.”

Lease dated July 17th, 1855. No Recorders' Certificate. Consideration, a yearly rental of \$500.00, upon conditions.

*Term of Lease:* '20 years from and after the 17th of July, 1856,' viz., *term expires July 17, 1876.*

Lease of the use and occupation of all water power at Dam No. One (1) on the Illinois and Michigan Canal at Joliet in said county. The water hereby leased is to be taken out of the canal basin above and adjoining said Dam No. One (1) at Lots Nos. Eleven (11), Twelve (12), Thirteen (13), Fourteen (14), Fifteen (15) and Sixteen (16) in Block Thirty-seven (37) in North Joliet, through openings in the wall of said basin left for the purpose, (etc.)

It is further agreed that on the expiration of this lease, the parties of the second part, shall be entitled to a renewal for a like term of years, for such rent as may be offered by the highest bidder.

(who shall also agree to purchase of the said party of the second part all their permanent and valuable buildings & structures, necessarily erected by the parties of the second part, for the use of the water hereby leased at such price as such buildings & improvements shall be adjudged to be worth, by three judicious, disinterested freeholders to be chosen as hereinbefore specified.)

And if no such bid shall be made, on the terms aforesaid, at a higher rate than herein specified, said party of the second part shall be entitled to such renewal on the terms of this lease, for the further term of twenty years.

And it is further agreed that at the expiration of the second term of twenty years above referred to, the parties of the second part shall be entitled to lease the said water power & lots for a further term of twenty years,

(if the said Trustees shall not determine to discontinue to rent the same) upon the same terms and conditions as last above referred to, or if other parties shall offer to pay more than the parties of the second part will pay, the person or persons so bidding more than the parties of the second part, shall be entitled to the same upon complying with the terms and conditions hereinbefore presented in case of renewal after the expiration of the first twenty years.

And if after the expiration of the first forty years here-in provided for, the party of the first part shall determine to discontinue the leasing of said water power the owner or owners of any substantial improvements on the lots hereby leased, shall be entitled to purchase the said lots upon which such substantial improvements are actually located, if offered for sale by the Trustees, or the use of the same, if not sold,—upon such terms as may be determined upon between the parties, in either case, or in case of disagreement between said parties, then upon such terms as may be determined by three disinterested persons chosen as aforesaid.

And it is further agreed that the said parties of the second part, shall by the written consent of the said trustees, have the right hereafter to draw water, for propelling machinery, at any other point on said Canal Basin above dam number one (1).

In testimony whereof the parties of the first part have caused this instrument to be signed by its president and secretary and their corporate seal to be affixed hereto.  
 703 And the said parties of the second part have hereto set their names and affixed their seals the day & year first above written.

In presence of  
 "J. O. NORTON"  
 "J. McROBERTS"  
 THE BOARD OF TRUSTEES OF THE ILLINOIS & MICHIGAN  
 CANAL

"HENDERSON HOWK" (Seal)  
 "JNO. H. PRESTON" (Seal)

by

Seal of  
 Board of Trustees  
 of the  
 I. & M. Canal.

"W. H. SWIFT," *President.*  
 "WM. GOODING," *Sec'y.*

To said copy of said original lease are also appended the following documents, which are abstracted as follows:

“(No Assignment by Hawk & Preston.)

Commissioners of the Illinois & Michigan Canal to G. W. Hyde, Assignee.	}	Resolution, Dated July 12th, 1872.”
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Requiring assignee to pay \$720.00 per annum for additional water power, making total rental of \$1220.00 per annum.

Agreement to abide by the terms of the foregoing resolution by said G. W. Hyde.

“Commissioners of the Illinois & Michigan Canal to G. W. Hyde, Assignee.	}	Purported Renewal Agreement of Lease, Dated August 10th, 1876. Term of Renewal: 20 years from July 17th, 1876.
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G. W. Hyde to J. L. Norton	}	Assignment of Lease, Dated July 1st, 1890. Consideration, \$1.00.
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Assignment is subject to all leases made by said Hyde.

John L. Norton to Economy Light & Power Com- pany.	}	Assignment of Lease, Dated September 1st, 1890. Consideration, \$1.00.
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Commissioners of the Illinois & Michigan Canal to Economy Light & Power Com- pany.	}	Renewal of Lease, October 3rd, 1896, for a further term of twenty years from July 17, 1896.
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704 Said renewal of lease agreement is in the following words:

“In pursuance of the stipulations in the foregoing lease in regard to the renewal thereof (and in accordance with a resolution adopted by the Board of Canal Commissioners of the State of Illinois on June 30th, A. D. 1896), the same is hereby renewed with the Economy Light & Power Company of Joliet, Illinois, for a further term of twenty (20) years, including the right of renewal.

WITNESS the signature of the President and Secretary

of the Board of Canal Commissioners of the State of Illinois and official seal of the same this Third day of October, A. D. 1896.

ALT. GERDES,  
*President.*  
THOMAS H. CANNON,  
*Secretary.*

The Seal of the Canal  
Commissioners of the  
State of Illinois.

And also the signatures of the President and Secretary of the Economy Light & Power Company, and the corporate seal of the same the day and year above.

ECONOMY LIGHT & POWER  
By J. L. NORTON,  
*President.*  
F. R. McMULLIN,  
*Secretary.*

The Seal of the Economy  
Light & Power Company,  
of Chicago, Illinois."

Commissioners of the Illinois & Michigan Canal  
to  
Economy Light & Power Company.

Resolution passed  
April 4th, 1901,  
increasing Water  
Power Rental,  
amount, \$1525.00,  
time, October, November, December,  
1900.

Commissioners of the Illinois & Michigan Canal  
to  
Economy Light & Power Company.

Resolution, October  
1st, 1900, increasing  
Annual Rental,  
place, Water Power  
Dam No. 1.  
Amount, \$10,457.00  
per year.

Economy Light & Power Company  
to  
Commissioners of the Illinois & Michigan Canal.

Acceptance of the  
foregoing resolution.

Certificate by John M. Snyder, Acting Secretary of the Board of Canal Commissioners that the foregoing is a true copy.



## 705 CONSENT DECREE THE CANAL COMMISSIONERS V. THE SANITARY DISTRICT OF CHICAGO.

"17312.

The Canal Commissioners	}	Bill for Injunction.
v. The Sanitary District of Chicago.		

And now on this 28th day of October, A. D. 1898, again come the respective parties to this suit, complainant and defendant, by their solicitors, and the court having had this case under advisement since the conclusion of the argument herein and being now fully advised in the premises does find as follows:

## (DUTY OF THE CANAL COMMISSIONERS.)

First: That the complainants, '*The Canal Commissioners*' are The Canal Commissioners of the State of Illinois, *duly appointed* and acting as such Canal Commissioners under the statutes of this State, and that the *Illinois & Michigan Canal with its bed, banks, basins, dams, locks, water power rights, lands, lots and all other property*, real or personal, belonging to it or used in connection therewith, *are by virtue of the statutes* of this State *under the exclusive care, management and control* of said Canal Commissioners, and that it is *their duty to maintain and preserve the structures* of the said Illinois & Michigan Canal, *and navigation on the same* and all its basins, and its locks, dams and all existing water power rights *for the benefit of the People* of the State of Illinois, as prescribed by the statute of this State.

## (LOCATION OF CANAL.)

Second: That said canal passes through Will County in the State of Illinois, and through the Village of Lockport and the City of Joliet, in said County. That the level of said canal from where it enters the Chicago River, in Cook County, Illinois, extending Southerly to the Village of Lockport, on Section 23, Township 36, North, Range 10, East of the Third Principal Meridian, constitutes one level, which is fed from the waters of Lake Michigan by means of pumps maintained and operated by

the City of Chicago at what is known as Bridgeport in said City of Chicago, and at the south end of said level and in the Village of Lockport aforesaid is situated what is known as Lock No. 1; that the second level of said canal commences at Lock No. 1, proceeding in a southerly direction until it reaches Lock No. 2, in the Town of Lockport aforesaid; that from Lock No. 2 southerly said canal proceeds until it reaches Lock No. 3, which is near to the dividing line between the Town of Lockport and the Town of Joliet, in Will County, aforesaid; that from said Lock No. 3, said canal proceeds southerly and enters Section 3, Township 35, North, Range 10, East of the Third Principal Meridian, on the North line of said section running to Lock No. 4 at a point about 300 feet south of the north line of said Section 3 where is situated a lock known as Lock No. 4, and that from Lock No. 4, said canal proceeds through Section 3 aforesaid, until it reaches what is termed the upper basin of the canal, which embraces substantially the bed and banks of the Desplaines River, said upper basin commencing on Section 3 aforesaid about 1,500 feet north of the south line of said Section 3, and said basin continuing over and including a small portion of Section 4, Town 35, North, Range 10, East of the Third Principal Meridian, and a small portion of Section 10 in the same town and range, and entering Section 9 in the same town and range, near the north line of said section, following the course of the Desplaines River, to a lock situated near to the center line of Section 9, Town 35, North, Range 10, East of the Third Principal Meridian, and near to a street in the City of Joliet, sometimes called Jackson street, said lock being known as Lock No. 5, and it being situated on the west side of said basin, and at said point said basin is terminated by a dam known as Dam No. 1 extending clear across said basin at its south end; that at the east end of said dam is located and situate Lots 11, 12, 13, 14, 15 and 16 of Block 37, of the Canal Trustees Subdivision of the North East quarter of Section 9, Town 35, North, Range 10, East aforesaid, which said lots are the property of the State of Illinois; that said canal continues its course from Lock No. 5 through the lower basin to Dam No. 2, and that said canal occupies from the north end of said upper basin to the said Dam No. 2 at the end of said lower basin, substantially the

original bed and banks of the Desplaines River; that at said Dam No. 2 an inlet is formed whereby water from the lower basin, aforesaid, is transferred to the level of the canal, known as the Channahon level, said level commencing about 300 feet above said inlet, and being protected by a Guard Lock at the north end thereof; that said Channahon level of said Illinois & Michigan Canal is continued through the City of Joliet, leaving Section 9 at or near a street known as Washington street in said City, and passing in a southerly direction nearly parallel with the Desplaines River through Section 16, Town 35, North, Range 10, and leaving said Section 16 at a point on the south line of said section, and west of the course of the River Desplaines, which river runs from Dam No. 2, southerly, through said City of Joliet.

(SECTIONS 3 AND 9 EXCLUSIVE PROPERTY OF CANAL COMMISSIONERS.)

Third: That said Sections 3 and 9 are sections which were selected by the Canal Commissioners of the State of Illinois, and conceded to said State, by the confirmation of such selection, by the President of the United States under date of May 21st, 1830, under and in pursuance of the grant of the United States to the State of Illinois of land for canal purposes, made by virtue of the several acts of Congress of the United States relative thereto; that the Channahon level of said canal so far as it passes through the City of Joliet, the Guard Lock at the north end of said Channahon level, the Dam No. 2, at the south end of the lower basin; the inlet for water into the Channahon level of the canal from the lower basin just above Dam No. 2, and the lower basin of said canal from Dam No. 2 to Dam No. 1 were all constructed prior to the year 1841, under the direction and by the authority of the statute of the State of Illinois, providing for the construction of the Illinois & Michigan Canal, in force at that time; that Lock No. 5, Dam No. 1, together with a provision for the utilizing of water power at the east end of said dam on Lots 11, 12, 13, 14, 15 and 16, Block 37, in the Canal Trustees Subdivision, North East quarter of Section 9 aforesaid, together with the banks and the towpath constituting the border of the upper basin were all constructed by the authority of the Canal

Commissioners, or by the Canal Trustees of the State of Illinois, prior to the year 1848; that on the 31st day of August, A. D. 1848, the then Canal Trustees of the Illinois & Michigan Canal acknowledged and afterwards caused to be recorded a plat showing their subdivision of said North East quarter of Section 9, Town 35, North, Range 10, East of the Third Principal Meridian, and that said Lock No. 5 and said Dam No. 1, and said lots in Block 37 of said Canal Trustees Subdivision aforesaid, are all exclusively situate upon the North East quarter of Section 9, Town 35, North, Range 10, aforesaid, and that said canal, its bed, basins, banks, structures, locks, dams, water power rights, are now the exclusive property of the State of Illinois, and have been such exclusive property since the termination of the trust estate, of the Trustees of the Illinois & Michigan Canal in the year 1871, and subject to such trust have been the exclusive property of said State since the consummation of the grant made by Congress to this State of land for Canal purposes, and the construction of said canal; that the State is also the owner of all of Block 1 in said Canal Trustees Subdivision of the North East quarter of Section 9, Town 35, North, Range 10, East of the Third Principal Meridian aforesaid, and has been such owner since the perfection of said congressional grant as aforesaid.

(DES PLAINES RIVER.)

Fourth: And the court finds that said Desplaines flows through the Town of Lockport aforesaid, in a north and south direction, and enters the upper basin of said Illinois & Michigan Canal at the present time, at a point about 1,200 feet north of the south line of Section 3, in the Town of Joliet aforesaid, and at a place known as the towpath bridge, and that since the construction of the said canal, said river has entered said upper basin at substantially the same point, and that the said Illinois & Michigan Canal, including its bed, its banks, its basins, its locks and dams, and the provision for water power rights at the east end of Dam No. 1, has been continuously maintained in substantially the same location, and in substantially the same manner from the north end of Lock No. 4, southerly, through the upper and lower basins and the Channahon level of said canal, so far as the same

extends through the City of Joliet, in the same place and location as when said canal, its basins, locks, dams and structures were originally constructed and completed, and since the year 1848, in which year, the court finds that said canal was originally opened for navigation.

(LEASE OF WATER POWER RIGHTS.)

Fifth: And the court further finds that since the opening of said canal, there has always existed and been owned by the people of the State of Illinois, under the control of the Trustees of the Illinois & Michigan Canal, in the first instance and their successors, the complainants herein, a water power right at the east end of said Dam No. 1, which water power right has been leased under a lease hereafter referred to, since the year 1856, for the benefit of the People of the State of Illinois; that there has existed since prior to the year 1864 a water power right for the benefit of the People of the State of Illinois, at both the east and west ends of Dam No. 2 aforesaid and that such right has been leased at the east end of said Dam No. 2 since the year 1864, and at the west end of said Dam No. 2 since the year 1883; that on the Channahon level of said canal within the corporate limits of the City of Joliet, and at a distance of half a mile south of said Dam No. 2, water is and has been drawn for power purposes as hereinafter found at three different places, which waters so drawn have been under lease by the Canal Commissioners of the State for the benefit of the People of the State of Illinois since the year 1883.

(LEASE OF WATER POWER AT DAM NO. 1.)

That said *water power right* at the east end of Dam No. 1 *was leased* by the then Trustees of the Illinois & Michigan Canal, *by a lease executed July 17th, 1855,* whereby the said lots numbered from 11 to 16 inclusive, in Block 37, in the Canal Trustees Subdivision, called North Joliet, together with the right of all water power existing at said dam, was demised *for the term of twenty years, with a right on the part of the lessee to an extension or renewal* of said terms upon the terms of said lease, on the expiration of the first term of twenty years, *for a further term of twenty years, and with the right*

708 upon the expiration of the first renewal of said lease to the lessees to receive a further renewal for an additional term of twenty years, and that said lease commanded by its terms to run on the 17th day of July, 1856, and the People of the State through their agent, have been continuously receiving their rents from the water power at Dam No. 1 and for said lost from the said lessees or their assigns from the date of said demise to the present time, and that said lease was at its expiration, renewed for a term of twenty years, which expired on the 17th day of July, 1896, and was subsequently renewed in accordance with its terms and requirements for a second and final term of renewal expiring on July 17th, 1916, which second renewal is now in force and outstanding, and that said lease contained a provision to the effect that if by reason of any improvement, alteration or enlargement of the canal, the amount of water power thereby leased should be increased or diminished, the same should be adjusted between the parties by a corresponding increase or diminution of the rent therein reserved for said water power, upon the basis of said lease, and that said rental was increased in accordance with said provision as against the assignees of said lease, on to-wit: the 31st day of July, 1872, from \$500.00 for the water power to \$1,220.00 per annum for such water power.

(DAM NO. 2 EAST END LEASE FOR TEN YEARS FROM OCTOBER 3RD, 1896, ACQUIRED BY SANITARY DISTRICT.)

The court further finds that the lease was made of existing water power at the east end of said Dam No. 2, so far as such power could be availed of by the then Trustees of the Illinois & Michigan Canal, to one Lorenzo P. Sanger, on the 12th day of September, 1864, and that said dam, have been continued and in force from the date of said lease to said Sanger, and that all of said water power at said east end of said dam No. 2, was on the 3rd day of October, 1896, leased to the American Stone Company by the Canal Commissioners of the State of Illinois, for a period of ten years, in conformity with the provisions and statutes relative to leasing water power, and by agreement the court finds that said defendant has duly acquired under the law of eminent domain the head and

tail races of said power and duly acquired in the same manner the leasehold interest of said lessee, all of which was so acquired before March 1, 1898.

(DAM NO. 2 WEST END LEASE FOR TEN YEARS FROM SEPTEMBER 11TH, 1883, ACQUIRED BY SANITARY DISTRICT.)

That an existing water power right at the west end of the Dam No. 2 was utilized by leasing the same by the Canal Commissioners to one John E. Bush in the year 1883, in conformity with the statute relative to leasing water power, for a period of ten years with the right of renewal thereof for ten years more; and that the said defendant has duly acquired under the law of eminent domain the head and tail races of said power and duly acquired in the same manner the leasehold interest of said lessee all of which was so acquired before March 1st, 1898. That on the 11th day of September, 1883, the Canal Commissioners leased to the Northwestern Tile Company the right to take water from the Channahon level of said canal for the period of ten years, being a right to draw water according to the terms of said lease on the Channahon level of said canal for power purposes, discharging the same into the Desplaines River, and that the use of said water so drawn from said Channahon level, under said lease has been continued by said lessee and its assigns, to the present time.

(OTHER LEASES.)

709 The said Canal Commissioners on the 11th day of September, 1883, leased to one James B. Speer and Frank H. Marsh the right to take water from the Channahon level of the Illinois & Michigan Canal, and use the same for power purposes, discharging the tail water into the Desplaines River by a lease executed in accordance with the statute of this State, and that said water so drawn from said Channahon level has been utilized under said lease by said lessees, or their assigns up to the present time.

The court further finds that on the 11th day of September, 1883, the Canal Commissioners leased to William M. Druley the right to draw water for power purposes from said Channahon level of said Illinois & Michigan Canal in accordance with the statute of the State of Illinois, where-



by said lessees received the right granted by said lease to draw water from the Channahon level of said canal discharging it into the Desplaines River, for power purposes, and that said water so drawn has been continuously drawn and in use by said lessee or his assigns since the date of the first granting of said lease, and that all of the water so drawn under said leases from said Channahon level of said canal has been drawn from the east side of said canal, so far as the discharge of the water is concerned, and at points where the differences in the level of the surface of the water in the Channahon level and the surface of the water in the Desplaines River, at a point where they discharge the water used for water purposes therein is about 13 feet and has been substantially of that head since the granting of said water rights and the utilization thereof by the Canal Commissioners in the year 1883 as aforesaid.

(ALL EXISTING WATER POWER RIGHTS AROSE PRIOR TO JANUARY 1ST, 1889.)

And the court expressly finds that all of said water power rights were existing water power rights prior to the first day of January, 1889, and prior to the passage of the act of the General Assembly entitled, 'An Act to create Sanitary District and to remove obstructions in the Desplaines and Illinois Rivers,' and prior to the approval of said act which appears to have been approved on the 29th of May, 1889, and except as the same may have been acquired by the said defendant herein, prior to March 11, 1898, are and have been continuously existing and in use as hereinbefore found.

(THE SANITARY DISTRICT, ITS CREATION AND PURPOSE.)

Sixth: And the court further finds that said defendant, the Sanitary District of Chicago is a municipal corporation organized under the act of the Legislature of the State of Illinois, entitled 'An Act to create Sanitary Districts and to remove obstructions in the Desplaines and Illinois Rivers,' approved May 29th, 1889, in force July 1st, 1889, and that the organization of said defendant was completed under the terms and conditions of said act about the 19th day of January, A. D. 1890; that said Sanitary District has proceeded to construct a main channel

710 for the drainage of said District, extending substantially from a connection with the Chicago River at Robey street in the City of Chicago, in the County of Cook and State of Illinois, to the south line of Sections 14 and 15, in Township 36, North, Range 10, East of the Third Principal Meridian, in Will County, Illinois, said township being known as the Town of Lockport; and that a large portion of the work of the construction of said main channel has been completed, and that said District has expended in the construction of said main channel and in and about the purposes for which it was organized the sum of about twenty-six million dollars before the commencement of this suit; that said main channel terminates near to the south line of Sections 14 and 15 in the Town of Lockport aforesaid; and that the slope mentioned in the 23rd section of said act under which said defendant is organized, as between Lockport and Joliet, and wherein it is provided 'in case a channel is constructed in the Desplaines River, as contemplated in this section, it shall be carried down the slope between Lockport and Joliet to the pool, commonly known as the upper basin, of sufficient width and depth to carry off the water the channel shall bring down from above, commences at the termination of said channel near to the south line of Sections 14 and 15 in the Town of Lockport aforesaid, and terminates at the point where the Desplaines River enters the upper basin as hereinbefore found; and that the plans of the Sanitary District provide for carrying the water discharged from said main channel between banks constructed by itself to a point near to the south section line between Sections 22 and 27 in said Town of Lockport, where said flow from said main channel is turned into the Desplaines River and from thence follows the course of the Desplaines River down to the point where the same enters the upper basin of said Illinois and Michigan Canal in Section 9, in the Township of Joliet aforesaid; and that by the terms of said act under which said defendant is organized it is required that a flow of water through the said channel shall be maintained of twenty thousand cubic feet per minute for each one hundred thousand inhabitants within the limits of said Sanitary District, and that the population of said Sanitary District is less than one million five hundred thousand people at the date of this decree, and

that the requirements of said law at the date herein would require said defendant to provide for a continuous flow at the present time of not less than three hundred thousand cubic feet per minute.

(DUTY OF CANAL COMMISSIONERS TO PRESERVE NAVIGATION  
IN ILLINOIS & MICHIGAN CANAL.)

Seventh: The court further finds that it is the duty of the Canal Commissioners to preserve the navigation of the Illinois & Michigan Canal; and that said defendant has no power or authority under its organic act to injure or destroy any existing water power rights on said Illinois and Michigan Canal which were in existence at the date of the approval, to-wit: May 29th, 1889, and the taking effect of said act, to-wit: July 1st, 1889.

(INCREASED WATER POWER RIGHTS AT DAM NO. 1 BELONG TO  
THE STATE.)

The court further finds that the amount of water which the channel of the Sanitary District is required by the terms of the act under which it is organized to cause to be brought down a slope between Lockport and Joliet into the upper basin of the Illinois & Michigan Canal, and the flow of which by the terms of said organic act it is required continually to maintain, will increase the amount of water flowing in said basin over Dam No. 1 from about 40,000 cubic feet per minute to at least 300,000 cubic feet per minute, and will increase the power now being used at said Dam No. 1, to a very large extent; that *the State of Illinois by virtue of said existing water power right at said Dam No. 1, and its ownership of the bed, banks and basins of said Canal, and said dam and locks at said Dam No. 1, is entitled to use and utilize any increased power which may be created at Dam No. 1, by reason of any increase in the amount of water flowing through said upper basin.*

(HEAD OF WATER AT DAMS NO. 1 & NO. 2.)

Eighth: The court finds that the mitre sill of lock 4 has been since the construction of said lock at an elevation below Chicago datum of minus 47.84 feet; that said Dam No. 1 when the water is at the crest of same is at

an elevation of minus 42.4 feet and that ordinarily the depth of the water over the mitre sill of said lock 4 is no more than is necessary, requisite and reasonably safe to preserve navigation on the Illinois & Michigan Canal, between locks Nos. 4 and 5 with said Dam No. 1 at its present height of 42.4 feet below Chicago datum; that the head of water under which power can be utilized since 1856 at Dam No. 1, is ten feet, and that the head of the water at Dam No. 2 under which power has been practically utilized since the granting of the leases as hereinbefore found, is practically 6 feet, and that the lease at Dam No. 2 called for a head of 7 feet.

(CONTRACT OF CANAL COMMISSIONERS WITH SANITARY DISTRICT BEYOND THE POWER OF CANAL COMMISSIONERS.)

Ninth: And the court further finds, that the provisions of the *agreement or contract* executed by the complainant and the defendant of date March 11th, 1898, and a copy whereof is attached to the original bill and to the original answer in this case, *so far as the same provides for or authorizes the construction of the new dam at the site of Dam No. 1, with the crest of such new dam at the elevation of 46 feet or at any elevation lower than 42.4 feet below Chicago datum and so far as the same provides for a conveyance by the Canal Commissioners to the Sanitary District of Chicago of the title to lands is beyond the power of either of the parties hereto to make under the statutes of this State, but in other respects said agreement is authorized, valid and binding; that said defendant is given no power under the statute to occupy any portion of the Illinois & Michigan Canal within the limits of the County of Will in the State of Illinois, except to cross the same; that such crossing must be made under the direction and supervision of the Canal Commissioners, and must be made in such a way as not to impair the usefulness of said canal and in such a way as not to injure the right of the State therein, and in such a way as not to injure or destroy existing water power rights, and the court expressly finds that said contract or agreement and the plans prepared for carrying out the work contemplated thereunder by said defendant, will impair the usefulness of said canal, and will injure the right of the State therein, and will unnecessarily*

greatly injure existing water power rights belonging to the people of the State of Illinois, appurtenant and belonging to said canal, and under the charge, care and control of said complainant.

(POWER OF CANAL COMMISSIONERS.)

Tenth: The court further finds that said Sanitary District had power under its organic act, and the *Canal Commissioners likewise had power under said act, to agree, as to the amount of compensation that should be paid to the Canal Commissioners for the benefit of the People of the State of Illinois for any property that might be necessarily appropriated by the Sanitary District for the objects of its creation that the plan of the Sanitary District for the utilization of the upper and lower basins of the Illinois & Michigan Canal in the City of Joliet, as finally modified, requires the entering upon and acquiring a right of way over a portion of Block 1 of the Canal Trustees' Subdivision entitled 'North Joliet, hereinbefore referred to and for the erection of a temporary crib work in the upper basin as shown by the plan, and the erection therein of a permanent masonry wall extending from lock No. 5 northward in the upper basin to a distance of 500 feet also for the erection of a new dam on the site of the present Dam No. 1 to a height of minus 46 feet below Chicago datum; and also for the construction of a crib work or temporary dam through the lower basin of said canal from Lock No. 5 to the guardlock at the head of the Channahon level and also for the permanent closing of the inlet to the Channahon level between the guardlock and Dam No. 2; and also for the building of a permanent masonry wall extending from Lock No. 5 to a junction with the tow path of the canal,*

712 *on the easterly side thereof near Jefferson street and south of the guardlock so as in effect to extend the Channahon level from its present terminus as located at the north end thereof, northerly through the present basin to Lock No. 5; for the excavation of said lower basin through its entire extent east of said permanent wall to a depth of minus 57 feet below Chicago datum at Dam No. 1, with a fall of 2 feet in each thousand feet to a point in the Desplaines river about 500 feet north of McDonough street bridge in the City of Joliet, which bridge*

is near to the center section line, east and west, of Section 16 in said Town of Joliet; and for the entire removal of said Dam No. 2; that such plans for such temporary crib work are sufficient and proper for the work sought to be done; that the plan for the wall extending northward from Lock No. 5 and southward from Lock No. 5 to the Channahon level is sufficient so far as construction is concerned; that the necessities of the case demand the removal of Dam No. 2 as contemplated in said plans, and also demands the excavation of said channel in the lower basin from Dam No. 1 through to Dam No. 2 and below that to the point where said excavation terminates about 500 feet north of McDonough street bridge in the bed of the Desplaines river to the depth and on the slope as contemplated by said plans, and as herein found, and that the same to the extent as herein found are proper and necessary under the organic act of said District.

(CREST OF DAM NO. 1.)

Eleventh: The court further finds that the *crest of said Dam No. 1* or any structure to be erected to take its place, *cannot safely be placed at a less height than the crest of the existing dam*, to-wit: at a height of 42.4 feet below Chicago datum; that said District has no power or authority to injure or destroy existing water power rights, and that the lowering of the crest of said Dam No. 1 to minus 46 feet below Chicago datum as contemplated in the proposed plans of said District would interfere with navigation upon the Illinois & Michigan Canal, and would also interfere with existing water power rights of the State of Illinois at Dam No. 1; and that said proposed plans so far as they relate to supplying the Channahon level are insufficient to supply to said level the quantity of water required for the navigation of said canal below said guard No. 5 and at the same time to supply water now and heretofore used by said water powers on the said level after compensating for the loss to said powers, consequent upon the loss of head thereto by reason of the increased flow of water in the Desplaines river below Dam No. 1.

(PAYMENT OF \$7630.00 TO CANAL COMMISSIONERS A REASONABLE COMPENSATION.)

Twelfth: The court further finds that on the tenth day of August, 1898, said defendant paid to Howard O. Hilton, the sum of \$7,630.00, as compensation for so much of Lots 1, 2, 3, 4, 5 and 6, Block 1, in North Joliet as might be appropriated by said defendant for the use of its channel, and as compensation for the property of the State, parcel of the said Illinois & Michigan Canal proposed to be used by said defendant in and through the lower basin of said canal, and that said sum of \$7,630.00 was received by said Howard O. Hilton as a tender by said defendant of such compensation, that such sum was a reasonable, just and proper amount to be paid by said defendant to said complainant for the public property used by said defendant, that said Hilton was at said time Treasurer of the Canal Commissioners, and had power and authority to receive said money, and that his receipt thereof was and is a payment of such amount to said Canal Commissioners and to the State of Illinois.

713 *And the court finds that the real estate for which said payment was made is described as follows:*

All that part and portion of said *Block one* (1) in North Joliet aforesaid which lies *within the boundary lines* of the *proposed channel* of said defendant as now there located, which proposed channel, as now there located is *three hundred feet wide*, and the center or middle line thereof is located and described as follows that is to say:—

Beginning at the point of intersection of the east line of Section Four (4), Township Thirty-five (35) North, Range Ten (10) East of the Third Principal Meridian, and a line parallel to the westerly reserve line of the Illinois and Michigan Canal, said parallel line being four hundred and seventy-five (475) feet distant from said westerly reserve line measured at right angles; running thence southwesterly along said parallel line for a distance of eight hundred and sixteen and twenty-nine hundredths (816.29) feet to a point of curve; running thence on a curve to the left of said curve having a radius of fourteen hundred and forty-nine (1449) feet for a distance of ten hundred and two and thirteen hundredths



(1,002.13) feet to a point of reserve curve; running thence on a curve to the right, said curve having a radius of six hundred and twenty-eight (628) feet for a distance of four hundred thirty-three and six hundredths (433.06) feet to a point of tangent.

Also all that part of the Southeast Quarter (S. E. 1/4) of Section Nine (9), Township Thirty-five (35), North, Range Ten (10) East of the Third Principal Meridian; lying west of the center line of Joliet street produced, east of the Desplaines river and north of the north line of Reed street in the City of Joliet.

Also that part of Lot Two (2), Block Three (3), Old Town of Joliet lying east of the east wall of the Illinois and Michigan Canal.

Also a certain tract of land in the Southeast Quarter (S. E. 1/4) of Section Nine (9), Township Thirty-five (35) North, Range Ten (10) East of the Third Principal Meridian, north of Jefferson street, west of the Desplaines river and east of a line fifty-six (56) feet distant from and parallel to the center line of the Illinois & Michigan Canal, said center line running through a point, in the south line of Block sixteen (16) West Joliet produced one hundred and seventy (170.00) feet distant from the southwest corner of said Block and forming an angle of ninety-five (95) degrees and fifty (50) minutes with said south line, measured from north to west.

Also part of the Southeast Quarter (S. E. 1/4) Section Nine (9) Township Thirty-five (35) North, Range Ten (10) East of the Third Principal Meridian described as follows:

All that part of Blocks three (3) and eight (8), and all that part of Benton street, Desplaines street and Webster street, Old Town of Joliet, lying west of the east wall of the Illinois and Michigan Canal. The above described property being situated in the Townships and City of Joliet, in the County of Will and State of Illinois.

And the court further finds that *in addition to compensation for the use of the real estate* above described, the said sum of \$7,000.00 *included compensation for the suspension for one year* for the use of existing water powers leased by said complainant on the Illinois & Michigan Canal to its tenants.

Thirteenth: That on the 15th day of August, 1898, *an injunction was issued by the order of the judge of this*

court in vacation upon the original bill in this case, *enjoining* and restraining said defendant and the agents, servants, attorneys, solicitors, officers, employees and contractors of said defendant, or any person connected directly or indirectly with said defendant or under its control or supervision, from in any manner *taking possession of or interfering with the possession of the Canal Commissioners* in and to Lots one (1), two (2), three (3), four (4), five (5), and six (6), in Block One (1) in North Joliet, in Section Nine (9), Township Thirty-five North, 714 Range Ten (10) East of the Third Principal Meridian and lying west of the upper basin of the Illinois and Michigan Canal, and from in any manner taking possession of or interfering with the possession of the Canal Commissioners in and to a tract of land situate in the City of Joliet in Will County, State of Illinois, located north of Jefferson street in said City of Joliet, and lying between the lower basin of the Illinois and Michigan Canal and the guard lock and level of the said canal running south from said guard lock, and from in any manner taking possession of or interfering with the possession of the Canal Commissioners in or to any of the lands, beds, banks, basins, dams, locks or any property pertaining to the said Illinois and Michigan Canal belonging to the State of Illinois and under the charge of the Canal Commissioners, and from removing any dam, or building any structure upon or excavating any part or portion of any basin or channel of the Illinois and Michigan Canal, and from in any way interfering with the Canal Commissioners in the exclusive control, management, operation or use, of said Illinois and Michigan Canal, its bed, basin, locks, dams, banks, or any other property, real or personal, appertaining or belonging to said canal.

Fourteen: The court further finds that the *plans and specifications submitted by the defendant* to the complainant, on June 28th, 1898, are adequate and sufficient for the works proposed by them, and are in compliance with the contract of March 11th, 1898, but *are not in compliance with the requirements of the statute* providing for the crossing of the Illinois & Michigan Canal, contemplated by such plans.

Fifteenth: And the court further finds that it has jurisdiction of the persons of the parties, complainant

and defendant herein, and of the subject matter of this suit, and that the complainant is equitably entitled to relief under the pleadings and proofs herein.

*It is therefore ordered, adjudged and decreed by the court,*

*First.* That the *contract or paper writing of March 11th, 1898*, a copy whereof is attached to the original bill herein, and which purports to have been executed by the complainant and the defendant, *to the extent herein found, is in excess of the power* of either the complainant or defendant to execute, and *to the extent so found is of no binding force or effect*, but in either respects is authorized, valid and binding.

*Second.* That said complainant and defendant have the right to agree as to the amount of compensation to be paid and received for the use of any property of the People of the State of Illinois, parcel of the Illinois & Michigan Canal, and that the sum of \$7,000.00 for the appropriation by said defendant and the use of said lots fronting on Jefferson street, and in the east side of the lower basins of said Canal, and for suspending for one year the use of existing water power, leased by said complainants, all the property of the state, and the further sum of \$630,000 for so much of the lots in Block 1 in North Joliet, as said defendant proposes to take and appropriate hereinbefore described, *are just and adequate compensation for such property*, so proposed to be taken, and water power so temporarily suspended by said Sanitary District, and belonging to the State for the use of an outlet to its main channel, and that the sum of \$7,630.00 paid to Howard O. Hilton on the 10th day of August, 1898, was a sufficient payment for the use of such lands and lots and property, and temporary deprivation of said complainant of the rental of water power and was made to the proper person by said defendant.

715 *Third.* That said defendant be, and it is hereby *perpetually enjoined and restrained from* in any manner *directly or indirectly injuring or destroying the existing water power rights* of the State of Illinois at Dam No. 1 aforesaid, and that it be and is hereby *perpetually enjoined* and restrained from proceeding to erect any dam or structure in place of Dam No. 1, which shall not have a permanent crest at a height equal to the permanent crest of Dam No. 1 at the date hereof, to-wit: 42.4 feet

below Chicago datum that it be enjoined and *restrained from in any manner decreasing the head of water for power and navigation purposes* now existing in the *Channahon level* of the said Illinois & Michigan Canal and herein found to be under ordinary and usual conditions about 13 feet, without compensating therefor by an increased flow of water into said level, equivalent to said loss of head that it be enjoined and restrained from interfering with the water power at Dam No. 2 and with Dam No. 2, except upon condition that it do furnish and supply proper and necessary facilities for the development of a power equal to that existing at said Dam No. 2 at some other place, and that it be enjoined and restrained from building any structures providing for an inlet of water into the Channahon level of the canal, except upon conditions that the structures be sufficient to preserve navigation on the Illinois & Michigan Canal, and the use of the water therefor as now used and provided for, including a flow of water to supply the lower levels of said canal from said Channahon level, and unless it also provides in addition to such flow, as may be required for navigation, such an amount of water for use on said Channahon level for power purposes as shall conform to the finds and requirements herein as to same; and that such perpetual injunction shall extend to and be operative as against said defendant the Sanitary District of Chicago and any and all persons, firms or corporations, acting or pretending to act by any authority of said defendant, whether such authority be direct or indirect.

*Fourth.* It is further ordered, adjudged and decreed by the court, that *said defendant be enjoined and restrained from in any manner entering into the lower basin* of said Illinois & Michigan Canal, or appropriating the same or any part thereof to its uses, *except on condition that it do excavate to a width sufficient to carry the flow of its channel*, and to a depth at Dam No. 1 of not less than 57 feet below Chicago datum, and continue such excavation to such depth of 57 feet below Chicago datum with such additional depth, through the said lower basin and to a point not less than 500 feet north of McDonough street bridge, situate near the center east and west line of Section 16, Town 35, North, Range 10, East of the Third Principal Meridian, as will be created

by a slope of such channel of two feet in each thousand feet in length southerly from Dam No. 1, said slope commencing at said Dam No. 1, and at a depth of 57 feet below Chicago datum.

*Fifth.* It is further ordered, adjudged and decreed, that a *perpetual injunction* issue out of and under the seal of this court commanding and enjoining said defendant, its agents, servants, contractors, employees, attorneys, solicitors and all other persons claiming to act under or by authority from defendant in any way, directly or indirectly, as is above stated, and that the temporary injunction heretofore issued in this cause, by order of one of the judges in this court in vacation, be and the same is hereby modified, so that the same shall be enforced and applicable to the extent specified in this decree, adjudgment a permanent injunction as against said defendant and no farther.

It is further ordered that the defendant, the *Sanitary District of Chicago*, pay its costs made in this case to be taxed by the clerk of this court.

716 And now on this 3<sup>d</sup> day of November before the settling of the terms of this decree and the signing of the same, the defendant, by its solicitors, here presents to the court its petition for a rehearing in this case, together with the affidavit of Thomas T. Johnston in support of the same, and here now moves the court for a rehearing of this case. And the court having heard arguments and being fully advised in the premises *doth overrule said petition and motion for a rehearing and denies said rehearing*. To which ruling of said court in denying a rehearing of said case said defendant by its solicitors then and there excepted.

And the defendant here now in open court prays an appeal to the Supreme Court of Illinois, which appeal is granted without bond. And the defendant is hereby given and granted sixty days from and after this date within which to present its certificate of evidence herein.

(To which order and decree of said court, except that part thereof overruling said petition, for a rehearing, the said complainants also now here excepts and prays an appeal to the Supreme Court of the State of Illinois, without bonds; which is granted by the court, and leave is given to said complainant to present and file a certificate of evidence herein, the same to be presented within sixty days, from this date.)

## BRANCH COURT OF THE WILL COUNTY CIRCUIT COURT

Of the September Term, A. D. 1898.

Thursday, November 3rd, 1898.

Court opened by proclamation of sheriff.

Present:—

Hon. Robert W. Hilscher, Judge.  
 Frank Vander Bogart, Clerk.  
 John Francis, Sheriff, and  
 William D. Heise, State's Attorney.

Attest:—

FRANK VANDER BOGART,  
*Clerk.*

717 The Canal Commissioners	}	Bill for injunction.
17312 <i>vs.</i>		
The Sanitary District of Chicago		

And now on this 3<sup>rd</sup> day of November before the settling of the terms of this decree and the signing of the same, the defendant, by its solicitors, here presents to the court its petition for a rehearing in this case, together with the affidavit of Thomas T. Johnston in support of the same, and here now moves the court for a rehearing of this case. And the court having heard arguments and being fully advised in the premises doth overrule said petition and motion for a rehearing, and denies said rehearing.

(To which ruling of said court in denying a rehearing of said case said defendant by its solicitors then and there excepted.)

And the defendant here now in open court prays an appeal to the Supreme Court of Illinois, which appeal is granted without bond. And the defendant is hereby given and granted sixty days from and after this date within which to present its certificate of evidence herein.

(To which order and decree of said court, except that part thereof overruling said petition, for a rehearing, the said complainant also now here excepts and prays an appeal to the Supreme Court of the State of Illinois, without bonds which is granted by the court, and leave is given to said complainant to present and file a certificate of evidence herein, the same to be presented within sixty days, from this date.)

COUNSEL FOR COMPLAINANT. Now, if your Honor please when

*Stipulation.*

very rapidly they were giving the testimony of Mr. Munroe, he testified thus:

"Q. When did you first become identified with this project to build a dam on the Desplaines River somewhere in the neighborhood of the Illinois? A. In the spring of 1904.

Q. Had you any connection at that time of any nature with the Economy Light & Power Company? A. No, sir.

Q. What was the first time you had any negotiations with the Economy Light & Power Company in reference to this project? A. In May, the latter part of April or the first week in April, 1906.

Q. In the meantime, you had acquired flowage rights or ownership to a large proportion of this property shown on Woermann's Exhibits 1 and 2, had you not? A. I had acquired title to all the property, tracts for title—" I suppose that means contracts, it is written tracts here—

"Contracts for title to all of the property shown in colors on those two exhibits and had made all financial arrangements for constructing the power house and dam at the mouth of the Desplaines River."

718 Later your Honor held that they would have to produce a deed, and they offered a sheet of blank paper as the deed with the understanding that they might bring it in later. Now, if your Honor please, with reference to that, I ask this: is it admitted or understood or stipulated that the title to the property in Sections 25, 34, 8 and Section 36, 34, 8, being the title to the property at the site of the dam, was acquired by the Economy Light & Power Company at this time, November 30, 1906.

## STIPULATION.

719 Thereupon it was admitted by the defendant that the defendant acquired title to the property on each side of the river at the site of the dam in Sections 25 and 36 respectively, both in Township 34 North, Range 8, by deed from Harold T. Griswold on November 30th, 1906, and that said Griswold acquired title to said property on each side of the river as trustee for Mr. Charles A. Munroe and Mr. Fank G. Logan, and that the said Mr. Griswold referred to first began to acquire interest by means of contract in the spring of 1904, which afterwards ripened into title. Some titles



were taken in Mr. Munroe's name directly, but whatever was taken in Mr. Munroe's name or whatever was taken in Mr. Griswold's name were all conveyed finally to the Economy Light & Power Company by said deed on November 30, 1906.

720 EXTRACTS FROM THE REPORT OF 1867 OF GENERAL JAMES H. WILSON, PARAGRAPHS 3 AND 6, AS FOLLOWS:

Paragraph 3:

"It possesses another advantage, almost exclusively its own. The two most opulent cities of the west are found at its terminii."

Paragraph 6:

"The real importance of this improvement can only be estimated by regarding it as completing a system, of water communication between the east and the west, of which the Oswego and Erie Canals, constitute essential parts."

721 EXTRACTS FROM THE REPORT OF 1883, THE SUBWAY OF MAJOR W. H. H. BENYAURD, REPORTED IN THE REPORT OF THE CHIEF OF ENGINEERS, 1884, PART 3, APPENDIX H. H. ON PAGE 1959, PARAGRAPHS 2 AND 3, AS FOLLOWS:

"As stated in my preliminary report under date of September 2, 1882, I had intended instituting a comparison between the cost of enlarging the Illinois and Michigan Canal between Joliet and La Salle, and that of improving the rivers between the same points; but as the survey of the latter was not at that time authorized, I merely confined my report on the Illinois & Michigan Canal to the cost of enlargement throughout its entire length, and without making any change to the river route. The additional cost of the river route in the first instance would be offset by the lesser amount that would be required for maintenance, repairs, and so forth, as the long line of canal, with its aqueducts, feeders, weirs, and so forth would be a constant source of expense. The river route has also the advantage, when it is considered that we have navigation on a stream 600 feet wide instead of the narrow channel of the canal.

Looking at the matter in an engineering point of view, it is difficult to understand what led originally to the construction of the canal, rather than the improvement of the natural channel of the river. Should the Illinois and Michigan Canal be accepted by the Government, and its

enlargement undertaken, that part between Joliet and La Salle would be abandoned and the river route between these points, adopted."

On the preceding page, paragraph 4:

"The rivers have an average width of about 600 feet, with banks from 8 to 23 feet in height above low water, so that within ordinary stages the stream flows within fixed banks."

722 EXTRACTS FROM THE REPORT OF THE COMSTOCK BOARD IN 1886, REPORT OF THE CHIEF OF ENGINEERS FOR THE YEAR 1887, PART 3, APPENDIX 2, W. C. ENDICOTT, SECRETARY OF WAR, PAGE 2125, LAST PARAGRAPH, AS FOLLOWS:

"The conclusion, therefore, would seem to be clear that the United States should not be bound to enlarge the existing canal between La Salle and Joliet, if the improvement of the Illinois River between those places will furnish a cheaper mode of communication, nor to maintain any portion of the canal, the abandonment of which may become necessary or desirable in the future."

723 EXTRACTS FROM HOUSE DOCUMENT NO. 263, 59TH CONGRESS, 1ST SESSION, PAGES 8 AND 9, AS FOLLOWS:

"Present improvements. The total distance from Lake Michigan to Grafton and the mouth of the Illinois is 327.28 miles. Beginning in Chicago River, 6 miles from the lake, the Illinois and Michigan Canal extends to La Salle, near the head of navigation on the Illinois, a distance of 96.7 miles. This canal has lost its traffic to such an extent that it has ceased to produce a revenue, and is falling into decay, which bids fair to soon become total. It is barely navigable for vessels drawing  $4\frac{1}{2}$  feet. For certain purposes it has been replaced as far as Lockport by the Chicago Drainage Canal, as will appear further on. Below La Salle the Illinois River has been improved by the State of Illinois, with lock and dams at Henry and Copperas creeks, covering a distance of 87.7 miles, over which the State charges tolls. The remaining 136.8 miles to Grafton has been improved by the United States with locks and dams at Lagrange and Kampsville. The project under which the work of the State and of the United States was done in the Illinois River contemplates a depth of 7 feet, the locks being 350 feet by 75 feet. Much dredging remains to be done to complete this project in the Illinois

River. It was intended to extend these dimensions of waterway to Lake Michigan to replace the obsolete canal, but when the State of Illinois decided to authorize the Chicago Drainage Canal it abandoned the project for a 7-foot navigation and directed the removal of its dams in the Illinois River, at the same time demanding that the dams constructed by the United States be removed. It declared in favor of a channel to be constructed by the United States not less than 14 feet deep from the end of the Drainage Canal at Lockport to LaSalle, 'to be designed in such manner as to permit future development to a greater capacity.' (See joint resolutions adopted May 28, 1889, and May 27, 1897, copies hereto appended, Appendixes B and C.)

None of the dams have as yet been removed, but by joint resolution approved April 21, 1904, Congress authorized the Sanitary District of Chicago, at its own expense, to lower the Government dams, and on the 23rd of May, 1904, permission was granted by the Secretary of War to that body to lower the dams 2 feet, upon condition that it install such movable crests as should enable the dams to be maintained at their present height during low water and upon the further condition that it hold the United States harmless from any claims for damages which might result from the operation of these movable crests."

That is ending on page 9 immediately preceding the heading "Chicago Drainage Canal." And on page 12, the first paragraph immediately preceding what was read on the other side: "The introduction of dams in the portion of the route where dams will be required." To secure the prescribed depth as a tendency to further increase the overflow. To keep this at a minimum it is proposed to make the dams of the movable type, which shall have no effect upon the water service at low and medium stages.

Then one paragraph on page 16: "As already stated the proposed dams are to be of the movable type." For the purpose of estimates the Channoine wicket type is adopted without service bridge and without regulating bear traps. The entire width of the river is closed by a continuous line of Channoine wickets. The details are shown upon the accompanying drawings.

And on page 45, and running over on the top of page 46 is a description of the operation of the Channoine Dam. It seems to me that that was all read.

## DEFENDANT'S SUPPLEMENTAL ABSTRACT.

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The following is an abstract of certain depositions, testimony and other data, introduced in the case of the People of the State of Illinois *ex rel.* v. Economy Light and Power Company in the Supreme Court of Illinois, in the February Term, 1909, Number 6242, on appeal from the Circuit Court of Grundy County, Illinois, introduced in this case, in pursuance of a stipulation authorizing such introduction, on behalf of the Economy Light and Power Company, and is as follows:

### DEPOSITIONS.

#### WITNESSES.

George Alexander,  
Stephen J. Williams,  
William S. Myers,  
George F. Gurney,  
Xavier Munch,  
James Boyne,  
Lewis K. Stevens,  
Jacob Adler,  
William S. Burt,  
David Layton,  
John P. King,  
Adam Comstock,  
James C. Kean,  
Enos Field,  
Urias Bowers,  
Oliver S. Chamberlin,  
Seneca Hammond,  
Peter O'Brien,  
Franklin Collins,  
John McCowan,  
R. W. Killmer.

## TESTIMONY.

## WITNESSES.

Robert Moore,  
Elmore W. Bewley,  
Nathan P. Pryor,  
Thomas Austin Mills,  
James Cornelius,  
Jeremiah Collins,  
Cyrus Copelantz,  
Isaac W. Richards,  
James G. Ellwood,  
W. H. Whisler,  
John McCaffrey,  
J. W. Rambo,  
Joseph E. McCullough,  
Thomas F. Boyle,  
Isaac N. Mason,  
L. L. Wheeler,  
Adam Comstock,  
John M. Snyder,  
Patrick Fogarty,  
Amos R. Brockway,  
Thomas T. Johnston,  
George H. Munroe,  
William P. Gray.

## OTHER DATA.

Extract from Parkman's LaSalle and the Discovery of the Great West.

Footnote I, p. 24, same volume.

Extract from Moses' "Illinois, Historical and Statistical."

Extracts from Margry, Vol. 2.

Extract from Harman's Report to the State Board of Health, 1901.

Act of Congress of March 30, 1822, authorizing the State of Illinois "to survey and mark through the public lands of the United States the route of the canal connecting the Illinois river with the southern bend of Lake Michigan."

Act of Illinois General Assembly, approved February 14, 1823 (Laws of 1823, p. 151; Statutes of 1856, p. 419).

Act of same, approved January 22, 1829; Statutes of 1856, p. 41.

Act of same, February 15, 1831, Sec. 7, Laws of 1831, p. 39; Statutes of 1856, p. 426.

Section 13, same Act.

All the foregoing Acts being now offered in evidence in the present action.

Extract from Message of William D. Ewing, Acting Governor, dated December 2, 1834.

Extract from Messages of Joseph Duncan, Governor of Illinois, of December 3, 1834, and December 4, 1838.

Report of Canal Commissioners of State of Illinois, Jan. 3, 1825.

Extracts from "Report of Canal Commissioners of Illinois to John R. Tanner, Dec. 1, 1900."

Commrs. of Ill. pp. 73, 74, and extract from a letter of J. M. Bucklin, engineer Illinois and Michigan Canal, to the Honorable Board of Canal Commissioners of the State of Illinois, dated Dec. 18, 1830.

pp. 81, 91 and 92. Extract from letter of J. M. Bucklin, engineer of Illinois and Michigan Canal, dated Jan. 1, 1883, to Charles Dunn, Acting Commissioner Illinois & Michigan Canal.

p. 135. Letter from William Thomas, Chairman of Committee on Canals, etc., dated Feb. 8, 1837, to the aforesaid J. M. Bucklin.

p. 135. Reply of J. M. Bucklin to the above letter of William Thomas.

p. 173. Extract from letter of Benjamin Wright, Civil Engineer, to the Bd. of Commrs. of Ill. and Mich. Canal, dated October 23, 1837.

pp. 146, 147. Extract from Report of Bd. of Canal Commrs. submitted by W. F. Thornton, Pres., Jacob Fry, Acting Commr. to Thomas Carlin, Gov. of Ill. Dec. 13, 1838.

Hurd's Rev. Stat. Ill. 1908, Ch. 121, Sec. 265. Extract from Report of Canal Commrs. Dec. 13, 1838.

Certified copy of stipulation in case of Philo W. Haven, et al., v. Bd. of Trustees of Ill. and Mich. Canal.

Extracts from Report of James H. Wilson, et al., as found in Messages and documents of War Department, 40th Cong. 3rd Sess. Ex. Doc. 1, p. 2.

Extracts from Report of W. H. H. Benyard and George

Y. Wisner, 48th Cong. 2d Sess. House of Rep. Ex. Doc. 1, p. 2, Vol. 2, etc.

Extract from "Sanitary District of Chicago, a concise report on its organization, resources, constructive methods and progress; Sept., 1903." Prepared by Chief Engineer; list of officers showing that Isham Randolph was that Chief Engineer.

Extract from Document No. 264, House of Rep.

Extract from Report of War Dept. 1900, Part V. Annual Reports of War Dept. for fiscal year ending June 30, 1900, being the Barlow Report.

Extracts from Reports of War Department 1901, Chief of Engineers, Part IV, etc., being reports of Majors Willard and Townsend and Col. Barton to Gen. John M. Wilson, dated November 17 and 18, 1900.

Extract from Report of the Ernst Bd., House Document No. 263.

Extract from Senate Journal of Ill. for 1836 and 1837, pp. 273 and 274.

Extract from "Report of Canal Commrs. of Ill. to Gov. John R. Tanner, Dec. 1, 1900."

Certified copies of record in McKee v. Canal Commrs. and Deed of James McKee and Sally McKee, his wife.

Extract from Report 1890, House Doc. No. 264, of the House of Rep. 51st Cong. 1st Sess. p. 40.

Extract from Report of Canal Trustees entitled "Complete List of States and Lands conveyed by the Trustees of the Illinois and Michigan Canal, showing size of state, appraisal sales, from Sept., 1848, to May, 1849, names of purchasers, etc., compiled by our Board Feb. 15, 1850."

Letter of W. H. Bixby, Lieut. Col. Corps of Engineers to Brigadier Gen. A. McKenzie, dated Mch. 27, 1906.

Letter of Robert Shaw Oliver, Asst. Secy. of War to Mr. Chas. A. Monroe, dated June 7, 1906.

Deed from Thomas Ford, Gov. of Ill. to William H. Swift, et al., trustees of the Ill. and Mich. Canal.

Deed from William H. Swift, Henry Grinnell and Richard Rowett, trustees, to the State of Illinois.

Certified copy of voucher of State of Illinois to Henry S. Piepinbrink, Sheriff of Will Co., covering payment of judgment in case against Slater and Druley. Marked Snyder Exhibit 11.

Snyder Exhibit 12. Voucher to J. D. A. Parks.



Certified copy of resolution of Bd. of Canal Commrs. of the State of Illinois, marked Snyder Exhibit 13.

In each instance there is included in the above offers in connection with Snyder's Exhibits the certificate of Snyder attached to each document.

Transcript from Abstract of Record of case of Druley v. Allen, Circuit Ct. of Cook County, App. 2, p. 3905.

Extracts from brief in the Appellate Court, of D. A. Parks, in said last mentioned cause.

Extracts from brief of appellant in case of Druley v. Allen, in the Supreme Court of Ill.

Extracts from petition for rehearing in same cause.

Extracts from report of U. S. Chief Engineer, 1901, part V.

Extract from Report of Chief Engineer U. S. Army 1876, part II.

Extracts from Warren Report and MacKenzie Report.

Extracts from Canal Commrs. Report of 1900.

Extract from Daily Chicago American of date of May 14, 1836, and September 14, 1839.

Opinion of Supreme Court of Illinois in *People, ex rel., v. Economy Light & Power Co.*, 241 Ill., 290.

NOTE: The transcript paging which appears in this, defendant's, supplemental abstract is that of the record in *People ex rel. v. Economy Light & Power Co.*

Depositions of George Alexander, Stephen J. Williams, William S. Myers, George F. Gurney, Xavier Munch, James Boyne, Lewis K. Stevens, Jacob Adler, William S. Burt, David Layton, John P. King, Adam Comstock, James C. Keen, Enos Field, Urias Bowers, Oliver S. Chamberlin, Seneca Hammond, Peter O'Brien, Franklin Collins, John McCowan, and R. W. Killmer, produced, sworn and examined on their oaths on January 16, 1908, and thereafter on days to which hearing was continued, on agreement of parties at the office of Frederick A. Hill, Master in Chancery of Will County, Illinois, pursuant to notice in above entitled suit. Said witnesses being first duly sworn, testified and deposed as follows:

## DEPOSITIONS.

1312 GEORGE ALEXANDER, a witness called on behalf of the defendant, testified as follows:

*Direct Examination.*

My name is George Alexander.

I live in the Township of Channahon, in Will County; have lived there from the fall of 1838. I was one year old at that time; my father moved there then. I have lived there ever since, except when out in business through the country.

My home was about forty rods from the Desplaines river on the south side.

1313 That was in the vicinity of what was known as Smith's Bridge. I recollect when that bridge was put up. There were two or three bridges before that.

When I first came there my father was engaged in the building of this Illinois and Michigan Canal. He was foreman of a quarry in Section 21. I own part of that section now. I think he was foreman about a year or so after he came there. That stone quarry was right where I live, about ten miles from Joliet down the river. My home is about four miles from the site of the dam which the Economy Light & Power Company is constructing near the mouth of the Desplaines river; that is, if you take the road zig zag, on the river.

1314 My father did not own the farm at this homestead at that time. He bought it right soon after. They had paid off the work with Canal Scrip, and he bought some more and paid them in Canal Scrip; 33 cents on the dollar it was worth.

I guess he got the farm property near the time the canal opened, about 1848; I won't swear to that, but that is my opinion.

He bought forty acres first; bought a piece in Section 15, another 80 in 22 and that piece on Smith's in 21. That split that quarter section line.

The bridge is on the quarter-section line.

He died a young man in September, 1856. Up to the time of his death he cultivated the land some; was generally on public work; helped to build this feeder to the Illinois and Michigan Canal.

Since his death, I have occupied that land and cultivated it.

1315 I raised corn, hogs and cattle. I do not think my father shipped any grain to the Chicago market while he was on that farm. Railroads were not running much at that time. He hauled wheat with three or four yoke of oxen and sold it at  $37\frac{1}{2}$  cents a bushel; hauled it down through the country there.

After his death in 1856, I shipped grain to the Chicago market. When I was quite a young lad, I fed up and bought a good deal and shipped on the Alton and Santa Fe; that was later of course.

I never shipped any produce from that farm to Chicago by boat over the Desplaines river. I guess nobody else ever did, that I saw go up there.

I have lived all my life on this river. Am familiar with it from, say Lockport, to its mouth. I swam horses through every mile from Lockport to the mouth of the Illinois river, where the Desplaines and Kankakee go together—pretty near every mile to cross the river. We had to get across the best way we could. We had to jump in and swim.

1316 I was familiar with the condition of the river before the construction of the Illinois and Michigan canal. I was not so well acquainted right in Lockport at that time, because I was a young kid.

I remember when they took out the stone for the Channahon locks, out of this quarry around Section 21.

I was familiar with the river from Joliet down to its mouth. We used, when we were young fellows, to go out fishing nights, and would go up these riffles and pull away and go over.

There are rapids between Joliet and the mouth at Treat's Island. There is a little island there, and a pretty strong current. There was shallow water there. Little row boats could go over these rapids, take the oars and ride down, in ordinary water.

1317 Before the canal was constructed, right down at this side at Smith's Bridge, there was  $1\frac{1}{2}$  feet of water in the deepest part, right on my land, right on his farm and mine together. During the summer season we had freshets, back snows up north that would come down the river there.

They used to have a gorge sometimes at the mouth of the Kankakee, and that would back the water up on us.

This bridge was finished in December, 1865, and in February, 1867, I think, there was a gorge down there and this bridge

was not anchored and the water came up enough to go over the piers.

Not during my recollection was it ever possible, before the construction of the canal, to run boats up and down at the point where the Smith bridge is located; boats for commerce, carrying passengers or freight.

Q. Has there ever been a time, Mr. Alexander, when boats for purposes of commerce ever actually ran up and down that river, between Joliet and the mouth of the river, within your recollection?

Objected to by counsel for complainant as calling for an opinion and being immaterial, incompetent and irrelevant.

1318 A. No, sir. No boat running up there, and nobody else has.

Q. You never, in your lifetime, saw any boats running up and down the river between Joliet and its mouth or between Lockport and its mouth, for the purpose of commerce, carrying freight and passengers?

Objected to by counsel for complainant, for same reasons as last previous objection.

A. No, sir, I never seen it and nobody else has.

Q. From your knowledge of the river, was it ever possible to run boats up and down that river between Lockport and its mouth for commercial purposes?

Objected to by counsel for complainant as irrelevant, incompetent, immaterial and calling for the opinion of the witness.

A. Not in the Desplaines river, no, sir. Ran boats in the canal.

There is a riffle above Smith's bridge; it was not possible for boats to go over that during summer season, unless they made some improvement. I have never seen it only in seasons of high water.

1319 According to my best recollection, that is true also of the riffle and rapids at Treat's Island. Hunters used to go down there in skiffs and camp; put up tents. There were no boats that went up and down it.

There is another riffle in the Desplaines down below Smith's bridge, at Whitmore's place. No water down there over two or three feet at any time. The mouth of the DuPage runs into the Desplaines right there. The water was pretty swift at that point. It took a good man to pull a boat up stream. It could be done in stages of high water. I pulled a skiff over

there; of course it was pretty hard work. We would go up there hunting ducks.

Q. Was it ever possible to take boats up there for commercial purposes, carrying produce or passengers over that riffle at any time?

Objected to by counsel for complainant as incompetent, irrelevant and immaterial, and calling for the opinion of a witness who had not been qualified so as to base an opinion.

A. No, sir; not in my recollection, never was.

I never in my lifetime saw a boat or knew of a boat carrying passengers or produce from market going up that river, and nobody else did in that country.

Never heard of any such boat going down the river, outside of what I told you of the men going out for a little time in the boat and float down the river. That was just a skiff—boats going out for pleasure purposes; at certain times the skiff could only go in certain places in the river.

In the summer time during ordinary stages of water a well-loaded skiff could not go over those riffles.

They had a stage route from Chicago down through La Salle.

They used to make stands there at Channahon.

1321 Q. Were the supplies that were used by the farmers in that vicinity that were obtained at Chicago, obtained over that stage route?

Objected to; incompetent and irrelevant.

A. I don't think they were.

They drove teams. Had a little wheat or something and took it to Chicago and traded it off for supplies and brought it home with teams.

I never, in my life, heard of any supplies or produce being brought from Chicago down to that vicinity in boats on the river.

I remember the aqueduct that is located down near the mouth of the river, at the point where the old Kankakee feeder is. They built it right about the time they finished up the canal; if I remember right, the canal was navigable in the fall of 1848.

It was somewhere in that neighborhood that the canal  
1322 began operations. I remember that some large stone were used in the construction of that aqueduct. They came off of this piece of land that Smith and I own, in Section 21, belonging to the canal at that time, off Smith's farm.

There are big quarries on the side right west of me in Section 21. I saw them hauling them; rode on the teams that hauled the stone down to the Aux Sable. Those stones were conveyed down to the aqueduct by horse teams and ox teams; any way to get them there. Forded the river above the Smith bridge. I rode on the wagon.

To my knowledge none of the stones were conveyed down the aqueduct by boat.

1323 Q. Would it have been possible to have conveyed them down there by boats, from your knowledge of the river?

Objected to by counsel for complainant as incompetent, irrelevant and immaterial and calling for the opinion of the witness.

A. No, sir. Not without a great deal of work and improvement there.

In that state, the river as it was then, it would not have been possible. I am pretty sure that not any of the stones used in the building of that aqueduct came from Joliet.

I say they did not; that is right.

There were a few stones picked at the mouth of Prairie Creek that runs into the Kankakee, but the majority of the stones came from our quarries, where Prairie Creek goes into the Kankakee.

1324 There was a quarry started there, and they used a great deal of the stone when they built the dam across at the mouth of Prairie Creek, 40 rods below the mouth, and there was a few stone used in building that lock there.

I remember dams in the river when I was a young boy. I do not think that I know of any prior to 1848 before the completion of the Illinois and Michigan Canal, but there is a dam right near Mr. Mills.

There was a dam kind of west of where the Economy is now constructing a dam; the dam they ran their mill with. I saw that dam over there, across, below it. That extended clear across the river. There were not any locks in that dam. They had a race there so they could get power for the mill. It was a closed dam all the way across.

1325 I do not remember when it was built. My father and me went down there. I would not say that I remembered the existence of that dam prior to 1848. I do not know whether it was there before 1848 or not. I was born in 1837. In 1848 I was 11 years old.

I remember the dam that was on the north branch of Treat's

Island. They had a race right across there that ran into the mill there. That was on the north channel. That was pretty much a closed dam clear across the channel. It was not a very big dam. There was no provision for any boats to go through there.

1326 I do not remember about the time when the dam at Treat's Island was constructed. It was before 1848 though, because I knew they had a corn grinder there and we used to take corn from home and go there and have it ground. I think I saw that dam at Treat's Island before 1848.

I do not remember any other dam in the river prior to 1848, besides the Beard's dam and Treat's Island dam.

I do not remember the existence of a dam in Joliet right above the Jefferson street bridge, prior to 1848, but they had that dam to lack the water to run down and feed the canal.

They had that dam for the levels of the canal to cause the water to run down.

1327 The dam has been there since my earliest recollection.

I do not remember the existence of any other dam in Joliet prior to 1848.

I remember there was a dam called Haven's dam, near Wallace street. It was a grist mill.

I remember the existence of a dam in Joliet where the plant of the Economy Light & Power Company is now. I saw it there—I do not remember when they built it. It was built there at an early date.

Q. You know it was there from an early date; that is at Jackson street in Joliet, that is called dam number 1, was there a dam at that point where dam number 1 is now, since your earliest recollection?

A. Well, I told you I was a young lad. I did not have much business around Joliet. I was around the vicinity, I remember, and knew what was going on, but I think there was a dam below where there used to be a grist mill.

The WITNESS. I do not know what they called it. They used to grind corn and make flour there.

Prior to 1848 the people had to go across the river the best way they could. Some places they could ford it, and when they could not, they went over in boats.

1328 There was not any bridge in Joliet until you struck Morris and the bridge at Morris was over the Illinois River.



Q. Have you forded the river between Joliet and the mouth prior to 1848?

Objected to as leading.

A. I drove a hundred head of cattle across and swam the horses after them.

Prior to 1848, before any bridges were constructed, there was a ford down where Brandon's bridge is. It was not a very good one. It was not a very safe ford, and you could ford it there at Treat's Island; go across the south branch and go across the island and ford the north branch, and then they used to ford across where the DuPage runs into this branch. That is all there was over there. Then that ford in this Beard's dam; below Beard's dam.

I do not recollect any bridges across the river below Joliet prior to 1848.

1329 We put up a bridge there where Smith's Bridge is, as you call it—a frame bridge. It was not there a great while before it went down with a load of grist and a pair of horses, and we put in another bridge and then in '65 we let the contract to F. E. Hinckley and they built this covered bridge there, that is Smith's bridge.

The first bridge built there I think was built along in the 50's—1852, somewhere along in there.

That was about the first bridge across the river, below Joliet, that I recollect. I do not remember when it was put up. I do not know exactly what year it was put up. There may have been some bridges in Joliet before that time.

These early dates I cannot give as correct as what happened later.

1330 The several fords that I have mentioned back before 1848 could be used at all times during reasonable weather in the summer time, except during a freshet. Were two fords at Millsdale, and one across by Mills House; another one of them on the north branch struck the Island, and there was one at the foot of the island.

This bridge that was built at the point where Smith's bridge is now.

The first bridge built at that point was not a swinging bridge so that steam boats could go through it.

I am familiar with the various bridges that have been built in recent years across the river between Joliet and the mouth of the river. I do not think any of them are closed now. They are not swinging bridges, all iron bridges now.

When I said closed bridges, I referred to whether they were covered or not.

The one we built in 1865 was a covered bridge, sided up and roofed over. It stood there until about 6 or 7 years ago; the abutments began to fail. It would have been standing there yet if it was let alone.

1331 I remember that on this Davidson property the river was fenced clear in, and there was across that bridge, over Brandon's bridge, right across Brandon's bridge on the river, I remember there was a fence laid clear down on the river quite a ways, but I did not pay much attention to it. That was at the south end of Joliet.

Q. Don't you remember that there was a fence for many years across both channels of the river at Treat's Island?

Objected to as leading.

A. I don't. I know Treat's Island was fenced.

Q. Why?

Objected to as incompetent, irrelevant and immaterial, calling for opinion.

A. Because otherwise cattle would cross over in there and eat the crops.

The fence on Treat's Island was right around there so as to keep the cattle from crossing the river and getting on the island and eating up the crops.

A considerable part of the land that my father owned and that I now own, was on the bank of the river. It ran down to the river.

1332 I did not fence the land down to the river, because the part where we owned was in a bog. There is quite a little lake around there before you come down to my place and the water was deep and the cattle very seldom swam there and we did not put any fence along the river.

Our fence at right angles to the river ran out in the water a ways.

Q. Did the farmers all along the river below Joliet fence their lands in the same way?

Objected to as leading.

A. No, I don't think they did.

At Whitmore's there is a regular fence along there; that used to be all opened, and they fenced up the DuPage.

When the farmers did have fences at right angles to the river, they ran them down to the water's edge and out into the water a piece so stock could not go around.

There were very few fences there in 1848.

The land along the river in Section 15 and this piece  
1333 in 21 and a quarter section in 22, we got hold of. I think  
Mr. Glynn, an uncle, came there soon after that. My  
father got killed in 1856, and I fenced the land in myself  
shortly after my father's death.

1334 We used to have old log canoes and boats built out of  
the siding and some out of plank—skiffs carrying 2 to 6  
men. We used to have these little Indian canoes, just to carry  
two in, if we would sit still. Those were used for transportation  
of people that had no other way of going across; did not  
have horses.

*Cross-Examination.*

I was born on the 27th day of October, 1837, seventy years  
old last October. I have lived right in the vicinity of  
1335 Channahon, during all that time. It is built on a line  
between Sections 22 and 15. That is the farm that I  
have described in my testimony. When I was a year old, my  
father moved there; have lived there ever since. Have been  
travelling around a little bit, but that was my home. I have  
been a jack of all trades, from farming I have been a stock  
raiser, and raised hogs, cattle and horses, and buy and sell  
most anything that comes along. My business has taken me  
along the course of the Desplaines River quite a good deal. I  
had control of three-quarters of a mile of it, from this bridge  
of Smith's up to the next neighbor's farm above me, and the  
river runs pretty near in a southwesterly course from my  
lands, and makes it a little longer, I guess. I have been  
1336 over it hundreds and hundreds of times, thousands and  
thousands of times from my place to Joliet, down to  
Morris and all along the line. Of course when I go to Morris,  
I go out of the Desplaines river latitude. I don't know a great  
deal about the Desplaines river above Joliet. I drove cattle  
to Chicago forty-five or fifty years ago this last fall, before  
the Alton railroad or the Rock Island railroad was built. I  
forded the river above Joliet and Lockport and through that  
country. Aside from the occasional fords, I have not been on  
the river to amount to anything. I was not so much acquainted  
around Lockport, but from Joliet down to the mouth of the  
Illinois river, I was well acquainted with it. I forded there  
above Lockport, but I was not up there all the time. The  
1337 testimony I have given in my examination in chief refers  
to the river below Joliet to the mouth. I would know

more about that than I did further up. I was not so much acquainted, being a young fellow at that time. Of course my business would not call me up there. My only experience with the Desplaines river between Joliet and its mouth has been that I have crossed it occasionally with cattle at the fords, and crossed with boats and other ways. I know right below my house, where there is a kind of a little lake from

Mill's Island down to this bridge of Smith's, I went out  
1338 there and took a rope and sounded it down there, and we got 14 feet of water in one spot. That was right opposite my land up above the house, and then you go down 80 rods and you could walk it with good high boots.

We used to go in a boat at night and catch a lot of fish, at the places where we found the depth of the water varied a good deal, some places a foot and a half and some places six feet. I can't say that I know how deep the water has got to be, in order to get navigation for commercial purposes. I know it depends a little on the size of the vessel, and how you load it. It has to be 6 or 7 feet on the Mississippi river. I shipped down there to St. Louis and Memphis and Cairo. It is my opinion that in order for the stream to be navigable for commercial purposes, the water must be 6 or 7 feet deep.

I am not giving this as an authority, because I am not  
1339 an expert on it. I was basing my answers as to the navigability of the Desplaines on what was asked me. I was asked if I saw a boat carrying anything, and I said I did not and nobody else did round that country.

They commenced using the canal in 1848. Between the date of my birth and that time, I was digging around trying to make a living the best I could. I drove the first repair boat on the Illinois and Michigan canal down below Channahon. There was a slide sloping off to the river. They had a lot of stone right down across the river. They kept sloping it down and have repaired it for years, but I guess they have got it solid now. Trees are growing through it.

1340 My father did not spend much time farming. I ran a few months on the repair boats, and drove team. My father was boss on there, but as soon as I got a little bit bigger he put me on the farm and I run the farm. He went down on the Iron Mountain Railroad. He built twenty miles of that through St. Louis. The first railroad built through this country was the Alton. I guess it was built along in '58 or '60. I drove oxen for a fellow through Hampton, below Elwood, over the land where they put the railroad through. I didn't do

any work on the Illinois and Michigan canal before 1840. I ran errands for the boys before the canal was finished. I did not in 1840, I was only three years old then. I commenced that sort of work when the canal started up the second 1341 time, I think about 1843. They shut the canal down once. I used to run errands when they were working in the quarry. They would send me over to Channahon for tobacco or some other thing, and I used to wade the river. I was about seven or eight years old at that time. I commenced to work on the canal under my father about 1850, I guess. The canal was running at that time. It commenced to run in 1848.

It was in operation at the time I was working on it. I 1342 know they used to ford the river and haul stones across to the Channahon locks, and from the DuPage river, haul them to the Aux Sable locks. They built those locks out of stone. The stone was taken down by horses, I guess a team, hauled down by wagons. A part of the stone in the Aux Sable locks came from Smith's. I know practically where it all came from. The biggest end of the stone came out there 1343 at the aqueduct and was hauled from some place down there. All kinds of stone, one ledge that was 4 feet thick and some that was lighter. It is not a fact that the locks at Aux Sable and the aqueduct, are built from sandstone taken from quarries near Aux Sable, and if it was, it was built from sandstone that came out of a little ridge at Solomon creek. That is the only sandstone works around there that I know of, but those Aux Sable locks had to be torn down, and they brought stone from Joliet and rebuilt them, not a great many years ago. I said that none of the stone used in these various improvements down there at Aux Sable, or at any other point below Joliet, came from the Joliet quarries. I know that because the Joliet stone is a different kind of stone from what they used there. I had been right there when they were building the locks and saw the stone hauled. I was about 5 or 6 years of age at the time this stone was taken down.

1344 You could notice the stone for forty years afterwards.

The stone showed for itself. I base my knowledge that they did not use any stone from the Joliet quarries there, upon the fact that the stone is not of the same character as the stone that comes from Joliet quarries, and upon my experience. I have been along there when they were doing all this work when I was a "kid." Prairie Creek is right up the Kan-

1345 kakee river towards Wilmington in a southeasterly course. I did not say that part of the stone used in im-

provements at Aux Sable come from there. There might have been a few stones put in the aqueduct, I mean the aqueduct at Dresden Heights; the abutments are there yet I guess. Of the rapids in the Desplaines river between Joliet and the mouth, there is one at Brandon's bridge, one at Treat's Island, one where the DuPage enters into the Desplaines. The one at Whitmore's farm and the mouth is all together where the DuPage runs into the Desplaines. There is a good strong river at the mouth of the Desplaines. There are five  
1346 rapids between Joliet and the mouth of the Desplaines river. Sometimes the water in those rapids is deeper than at others. Sometimes if you had a good pair of boots, you could ford it without getting your feet wet. That would be in July, August and September may be. Three months it would be so shallow that you could wade across it with your boots on, a little more than a foot. There would be spots in there maybe a foot and a half deep. The current always drifted to the south side of the river, that was  
1347 the deepest channel. I should think there in the deepest part of it, at all times of the year, there was as much as 18 inches of water in the channel at that rapids opposite my place. I think the channel would be pretty near 40 feet wide there. The north side of the river sloped off, it is smother, goes out gradually. At the lowest stage of water, at the rapids at my place, on my side of the river, there was a channel about 40 feet wide, with an average depth of 18 inches, somewhere along about that. Down at Whit-  
1348 more's Bridge, it was a little deeper than at my place, 2 or 3 feet, or 2½. As near as I can guess, in the channel it would be that deep. At Whitmore's the channel would be all of forty feet, I got the feed from the Du Page river there. At every one of the rapids, mentioned, with the exception of Treat's Island, there was a channel of a width of about 40 feet, with as much as 18 inches of water all the way across it at the lowest stage of water in the Desplaines River. I think that is about right. Treat's Island with reference to my place, is about a mile and a half or two miles northeast. At Treat's Island I generally went on horseback when I forded  
it. I waded it a few times. It might vary as much  
1349 as a foot and a half in the deepest part of it. I think there was a foot of water there. I don't know as I can tell you if there would be a period of six or eight months of the year in which the water on all of these rapids, would be



over two feet in the channel. I did not keep track of it, but some seasons it kept a good deal lower than at others. It depends on the weather. I think there was always 18  
1350 inches of water in all of these rapids, excepting at Treat's Island,—for a short distance of course. This depth of water of 18 inches on all of these rapids, for a distance of 40 feet in the channel, at the lowest stage of water of the Desplaines river, existed prior to and after 1848. At Treat's Island there at the foot, I should say the length of the rapids up and down the river, was about 40 rods. At the upper end of the Island, there were two branches. We crossed one branch and got over to the island, and crossed the other branch and got over to the other side. The rapids came out on each side of the island.  
1351 There was a channel on both sides of the island, and there was not much difference in depth. On the south branch the water would be as deep as 2 feet for four or five months of the year, this before 1848, but I guess the north branch would not go that depth. The channel in the south branch would be 40 feet. I think prior to 1848, there was a channel in the south branch of the rapids at Treat's Island 40 feet wide, and containing as much as 2 feet of water for a period of five months in the year.  
1352 There are places there in the Desplaines between Joliet and its mouth, where it was not deep enough to run much of a boat; they had to get along there with a light boat. The water was deeper at all places between Joliet and the mouth of the river, than it was at the rapids I have mentioned, a little kind of lakes formed. It was wider and deeper.

Brandon's dam that I spoke of was outside of the mouth of the Desplaines river, I think six rods maybe. That was put in there a long while ago. I think it was put in after the Illinois & Michigan Canal was built. I ain't going to swear to that, one way or the other. I think the canal had been  
1353 in operation before Beard's dam was built. Anyway it was built about the same time. The next dam that I mentioned was at Treat's Island. There was a little dam put across the north branch. Had a race to run the water down to run the sawmills. It was only a temporary fixing across the south channel. They put a good dam across the north branch. I don't think that was built after Brandon's dam was built, as long as I can recollect. Mr. Treat built it.



The next dam up the river, I think Malcolm run this across,—the mill below McDonough street. I don't know when that was built. They had a wheat mill there and had wheat ground, when I was quite a chunk of a boy. If it was built after the Illinois and Michigan Canal, it was quick after it. I know I took grist there when I was about ten years old, and

I am now about seventy. I don't know how long it had 1354 been built then. Malcolm run it. According to my memory, the next dam up the river, was right here at Joliet. I don't know when that was built. I know they had it built before the canal was in operation, because they had to have a feeder to have this water come down here. I think it must have been built about the time that canal was, because the canal crossed the river and comes over on the other side. I suppose it was built for the purpose of supplying the canal with water and power. Norden & Company built this dam here where the electric power is now. I don't know what year that was built in. I think it was built after the canal was in operation. I am not positive about it, but my opinion is it was. It was my father shipped the grain. He hauled it up with yoke teams somewhere in the 40's, about '48 or '50, somewhere in there. I don't know that it was after the canal was in operation. They run grain up the canal pretty quick after they got it open. When I came to operating the farm, I usually shipped grain to Chicago by railroad mostly. I fed most of the grain I raised for many years and then bought a good deal. I never saw boats pass over the Desplaines river prior to 1848, and I did not see anybody that did. I know ever since I was big enough and got along the river

1356 hunting ducks and the like of that, there was no boats running in my time after I got big enough to get out.

I guess I wouldn't remember what occurred on the river from 1837 up till 1845. I don't know that no boats ever did go down the Desplaines river carrying feed prior to 1848. I know enough old settlers around there and could get information about the matter, and as an individual I could see them going down. But they did not go down, and you can't produce a man in this state that ever saw one go; that 1357 is my opinion. I don't remember as I ever saw a fence across the Desplaines river. The fences extended down into the river apiece, and did not run parallel with it. They did not run all that way across it. Wherever the water 1358 was any depth among the riffles, they had fences along the river bank, I mean parallel with the river. At

Glidden's on that farm where Mills is now, they had a piece on the south side of the river that had a fence all along so the stock could not go across. That was to prevent stock wading and crossing the river and getting into the crops of the other farmers there.

*Re-direct Examination.*

The locks at Channahon were rebuilt somewhere about 12 or 15 years ago I should judge, and the locks at Aux Sable were also rebuilt about 10 or 15 years ago. At the time these locks were rebuilt, Joliet stone were used. They 1359 brought them down a canal. When I testified that the locks were built from stone taken off of Section 21, I referred to the original construction before the canal started at all. I have taken a boat up the channels that I spoke of where the rapids were. Sometimes I would row it up, but most of the time I would push it up when we were fishing nights, to go out and push them right along ahead of us. The boats that were taken up those rapids were taken up that way most of the time, unless it was low or when the current was very strong. I have been up through the rapids at Treat's Island. I have rowed a boat up through there after I got over the worst patch. There is a little piece in that lake very swift for a while and then they ease up a while, but after we got to the bend of the island there was forty rods over there that was real swift. We pushed the boat up part of the way and rowed it up 1360 the remainder of the way. We did not go there a great deal to fish. We would go where it was full, and if so, we would get all we wanted. It would be one trip up and back. Where these channels were in the rapids, there were these niggerhead stones all along in different places. I used to pick them up and carry them to the place where I forded. We used to pick them up and fill them pretty well up, so we would have to clear that out once or twice a year.

Q. Was it possible to step from stone to stone and across at those fords without getting the feet wet?

Objected to as leading.

A. Well, it was not down in our place, quite. There was space where there was a big channel you could not quite step over.

At these various channels where there were rapids, I saw

it, a good sized stone would be sticking up out of the water and some sticking up and some under. I did not mean at these rapids there were channels forty feet wide that were entirely clear from stones, so that boats could go up and  
1361 down without hindrance. Could not go up there, stones all the way, a tough match to get a skiff up.

Q. These channels were filled with stones, some sticking out of the water and some under it, so it would be impossible to navigate it; isn't that true?

Objected to by counsel for complainant as leading.

A. Yes, sir; that is true.

STEPHEN J. WILLIAMS, a witness on behalf of the defendant, testified as follows:

1362

*Direct Examination.*

My name is Stephen J. Williams. I reside right opposite Romeo in the Township of Du Page. Romeo is the next station above Lockport on the Desplaines river. If I live until next September, I have lived there about 63 year, I think. I am going on 63-64 years. I was born in that same place. My father lived there before me. He was one of the contractors on the Illinois and Michigan Canal a long while ago in '36. He lived there long years, I don't know how many, I think 53. He lived there until he died. I think I heard him say he moved there in '34. My business is farming and raising horses and cattle. I have about six or seven hundred acres. I think Romeo is about three miles from Lockport, about seven miles from Joliet. I am not familiar with the Desplaines down to its mouth from my home. I am familiar with it right around in our country there. I never went very much south down that way. My business did not call me that way, but from Lockport up I know all about the Desplaines river. I am not familiar with the Desplaines river any further than Joliet. I never went down that way. I went down to Channahon to buy a few cattle, never paid any attention to the river. My going back to the early days when I was a young boy, there were no dams in the river in our country. I don't know anything about the dams, only about the river up in our country. To my knowledge the river up in our country has never been navigated by boats carrying freight or passengers, never

to my knowledge. I do not know of any navigation of the river up above Lockport for commercial purposes. My home was right on the bank of the river. The cattle used to run back and forth across there all the time. I never heard of any boats going up and down the river at any time with passengers or freight.

1365 Q. From your familiarity with the river above Lockport, I will ask you if it would be possible for boats carrying freight or passengers to be navigated up or down that river during ordinary seasons of the year?

Objected to by counsel for complainant as calling for the opinion of a witness.

A. I don't see how a boat could come up that river. It wasn't deep enough.

The biggest boat that I ever saw on the river in my life is, sometimes we used to get a boat to row around and spear some fish; two or three of the hired men used to go down there and spear fish there; that is the only kind of a boat I ever saw on the river.

Q. Were there any rapids in the river above Lockport that you are familiar with?

A. No, I am familiar with the whole river from Lockport up, but there was never no place the water wasn't deep enough.

The WITNESS. There were fords in the river above Lockport. We used to cross at Romeo and there is a ford there yet. You could ford any place there. The water was 1366 not deep. Some parts of the summer you could walk across without wetting your shoes; in the spring it is deeper during the flood season, but since they turned the water the other way by digging this canal, the Sanitary District Canal—it has made the river a little deeper, but then we cross all the same. Before the time the Sanitary Canal was built, it was a good deal shallower than it is now. Lots of riffles we could cross up above Lockport during the summer season without getting our feet wet.

Q. You don't think it would be possible during that season of the year to run boats up and down?

Objected to by counsel for complainant as being argumentative.

A. Well, in the summertime, you couldn't get a plank down there.

The WITNESS. It was a pretty good current there when it

run. I don't know of any dams in the river above Lockport or at Lockport.

1366 Q. Did you know of the Daggett mill at Lockport?

Objected to by counsel for complainant as suggestive and savoring of cross-examination.

1367 A. Why, certainly. We used to take our flour down there take our wheat down there to get it ground.

It was that mill then. Dr. John F. Daggett.

They had water power there.

Q. Wasn't the water power produced by the dam that crossed the river at that point?

Objected to as leading and suggestive.

A. The water that they used there to run that mill looked to me as if it was always coming out of the canal from Norton's mill. The water from the mill that he had in Lockport, right down there, and they had a race.

That is the way it looked to me, although I never took much pains to look that over.

I do not believe there was ever a fence across Desplaines river, above Lockport, within my recollection, but it seems to me that Mr. Alderman put a fence across there once, but I would not be positive. We were going to put a fence across there.

Objection by counsel for complainant, to the witness stating what they were going to do.

1368 The WITNESS. You see, in the spring of the year when the water raised there for a while, it would take the fence away; that is, the ice would take the posts away. We could not put any posts there because it is all rock bottom, unless you would drill a hole down in the stone, and we thought we had better not put a fence there, because when the river broke up in the spring, the ice would lodge on the posts and destroy the fence.

This fence that may have been built by Mr. Alderman was not a bit further than my land runs. There is a jog there in the section, and Alderman owns east of me on the north.

It was just above my place, only the fence between me and him; only you know his land protruded further east than mine.

Q. State whether or not above the river on your own land, or on your neighbor's land, or on any farms above the river or the farms that ran down to the river, whether the

fences were built at right angles to the river and ran right down into the water?

Objected to as leading and suggestive.

A. I could not say positively it was.

The wires were stretched across the river.

1369 The fences were put there before the Sanitary District built that ditch there; that is what I think, I would not be positive, but it seems to me that that was the case. There is no fence here now. There is a bridge across the river running to Romeo. We had to drive across the river last year and had to ford the river with the grain and everything. I do not remember any bridges across the river there, or elsewhere, above Lockport, dating forty or fifty years back; no bridges at all. I recollect only one bridge in that vicinity and that was the Illinois and Michigan Canal bridge at Romeo.

When I was a boy ten or twelve years of age, produce was shipped from the farm to Chicago by boats on the canal. The first railroad was the Chicago & Alton. That was built a good while after that. I cannot tell exactly when it was built.

1370 Before the railroad was built and after the canal was in operation, we traveled between Chicago to Joliet on packets on the canal. There were two lines of packet boats running back and forth; one line they called the "Red Bird" and the other the "Green Bird" line of packets.

### *Cross-Examination.*

I was born in 1846, on the 22nd day of September, right on the same place where I live to-day; across from Romeo, in the Township of Du Page, right across the line from the Lockport line, which separates that town from Du Page Township, within 80 rods of where I live,—all in Will County.

By occupation I have been a farmer, stock raiser, 1371 and dealer. That is what I have always done. My home is about 200 rods from the Desplaines river in Section 34.

I do not know any of the gentlemen interested in the Economy Light & Power Company. I said that in certain seasons the water in the Desplaines river was very low, so that in places where the riffles are you can step from one cobble stone to another and across, without getting wet. That is just right. In other seasons of the year, it was pretty deep, speak-



ing of the water on these riffles. Take it along about  
1372 the time of the breaking up of the ice, the latter part  
of March, it might be for a couple of weeks shallower,  
and then other times a good deal higher, but it would soon  
go down; it would not last long. On those riffles for a while  
after that it would be up to the horses' knees, may be a  
little bit higher. By that I mean one and one-half feet, or  
two feet, along there, about that, on the riffles.

It was lowest along in the fall, July, August and September.  
It would not be very deep on the riffles in the winter, or when  
the ice was formed, a couple of feet. I think, if I recol-  
1373 lect, the riffles were ordinarily the shallowest places.

The way it was, the shallowest places would be supposed  
to be right here (indicating), there would be a place, prob-  
ably reaching so (indicating) that would be deeper, and then  
would come up again and go to low water again and be an-  
other hole in there in the river. Where the riffles were was  
the lowest sheet of water. The other part, where the riffles  
were not did not amount to so much. It was in holes. We  
used to, when I was young, take the horses down there and  
wade them in the deepest places and wash them off, and I  
know some of the holes used to come up to the horses'  
1374 sides. That would be four or five feet deep. I do not  
know the river below Joliet.

I never saw boats on the river up there; I mean boats that  
would carry merchandise or passengers. I mean boats that  
people would want to take, the lumber from Chicago. I have  
seen lots of boats that would hold a couple of men around  
there that would be fishing, but I never saw any boats bigger  
than that. They were fishing around the holes. They  
1375 would take their fishing hooks and sit there and fish. I  
saw that a good deal. We waded in when I saw a boy.  
The hired man went down there. They had gotten hold of  
what they called a jack and had it filled with some kind  
of bark and lit it and I went along and carried the fish.  
Every one of them waded along the river and speared fish,  
and we stayed there until 12 or 1 o'clock at night.

Q. How deep water is necessary in your judgment for  
navigation for commercial purposes?

A. Now, sir, I just give up that job. I know mighty well  
that it would not carry much of a ship up there. I think an  
ocean liner would have no use there at all. I think Evans  
would have no use up there.



Suppose a boat was 30 feet long and 10 feet wide, 1376 carrying five tons of freight,—I have not got the least idea in my mind how much water it would take to float that kind of a boat; I do not know how much it would require; that is not in my business.

As to how far back my memory serves me, I recollect the day my father went to California, in 1850. I was born in 1846 and was four years old then. I would not recollect about boats passing up and down the river at that age, but

I recollect the packets because they used to blow the 1377 horn for Jim Templeton to open the locks. The packets ran on the canal as long ago as I can recollect. I do not know when the old canal was finished and ready for operation. I think there is more water now than there used to be. I refer to the water thrown in from the Drainage Canal. It is confined to the west more, it used to be spread more. The river used to be wider than it is now; that is in the spring, when the freshets would come, it used to be wider. Now it is in the regular channel.

There is an island right where I live and the river spreads, and goes to each side of this island, and the main river there, after it goes past the island, I should think it 1378 must be 150 feet. I do not think it is 350 feet wide. I know the Drainage Canal in the rock region, up here in Lockport. The channel there, I think it is 100 feet wide. I think the river was about one and one-half times as big as that; and if it turned out that the Drainage Canal is 160 feet wide, and the river was a half wider, that would make it 240 feet. I never measured it. I am just speaking of what it seems to me. Years ago, before the canal was dug there, to the north of me, it was a good deal wider. It was spread over more territory, because the river used to spread toward the east, and this water came down there. I think now is just about the way it used to be.

They dug the channel along there and the drainage bed is right in the middle of the river, to keep it from spreading. I think at this time that since the Sanitary District has put in the Drainage Channel, and throws the water in the Des- 1379 plaines river, the river now is about the same width as it used to be in the early days. I do not think that the amount of water is the same. I think it is a little deeper now. I would think it was probably 8 or 10 inches.

I said in the first instance that I knew of no fences across the river. I think that there was one fence in there. I am

not quite clear about that, I would not be positive. My father had a fence right alongside the river, running parallel with the river, I should judge two rods or so from the river. It might have been a little bit more. That is the only fence

I have any distinct recollection about. That did not cross the river. I am not at all sure of any fences crossing the river. I know about other people having fences within two or three or four rods away from the river, running along with the river. I know of other fences that were two or three or four rods or more away from the river. The fences would run for a number of yards in a straight line and then the direction would change a little for several rods again, in a sort of meandering way along the edge of the river. None of them pretended to follow the water line, just followed as near the river as they dared to go. My father's fence I think was built about war time, along about 1861. That is the only fence that was there, and Chris Corrals adjoined our land. He built a fence. Those are the only ones I know of. It might be there was on above that, but I am not certain.

That was the state of affairs about 1860 or 1861. The fences got dilapidated when the ice formed and took away the posts and wires, and we had to stop it. I am talking of the fences that ran along the river the same way the river runs; that ran lengthwise with the river on the bank. The two fences that I have mentioned are the only ones that I have any recollection of. I never knew of any more, at that time.

*Re-direct Examination.*

Those fences were built along the river to keep our cattle in pasture; otherwise they would have strayed away and got on the land of somebody else across the river.

These riffles that I talked about in the river above Lockport, I did not say that in them the water during the low season, or when it was at its lowest, would run over one foot to two foot in depth. The lowest in some places you could walk across in your slippers without wetting your feet. That was along in the fall there. I do not know as I could tell how it would average during the entire summer, after April or September. Sometimes the water was not in any place except in those holes. You could look between the stones and see the water running down. That would not be the condition of things during the entire summer. Some-

times both channels would be running. There are two channels there; one on the east and one on the west. These two would run some of the time, and there would be eight or ten inches of water in them, and after awhile they would dry up. There would be more than eight or ten inches of water in the shallow places, sometimes in May. In July, August and September it was dry time, but sometimes there used to come up a big thunder shower up north where there would be more water come down just for a short time. It only 1384 lasted two or three days. After that it would come down to the old thing. When the water was high, you could not see any rocks there. There was one rock right near the bridge. When this high water came on, I could not see that rock. I watched that rock, and could see the water come down along the side of it. There are not so many big rocks there. There is once in a while a big boulder, but there are only a few boulders.

1385 WILLIAM S. MYERS, a witness for defendant, testified as follows:

*Direct Examination.*

My name is William S. Myers. I live in Lockport. Have lived there since the 18th day of May, 1841. Was born October 29th, 1815. When I came to Lockport I clerked for a Mr. Norton, before I went into the mercantile business myself, in 1843, and went out in 1859. Since then I have been dealing in real estate, somewhat. I live right near the City of Lockport. Have lived there since 1841. Was in St. Louis about four years in business for my brother-in-law. The Desplaines river runs at or near the outskirts of Lockport. I have seen the Desplaines river very frequently. Never 1386 swam nothing bigger than little row boats there. Never saw any freight boats, or boats carrying passengers. To my knowledge, no boats used for commerce ever ran up and down that river. Never heard of any boats used in commerce running up and down the river. Never heard of anybody navigating the river down to the mouth from Lockport. In 1841 people got into Lockport from Chicago by four-horse stage. That was the only public conveyance until the canal was finished. I do not know the name of the stage line. It did not have any special name. Produce was brought from

Chicago by wagons and sleighs. If produce went from Lockport to Chicago, it went by wagons and sleighs.

1387 I am not familiar with the different shallows and riffles in the river.

There was a dam in the river there at the mills, and Mr. Norton, for whom I clerked, had a mill there at that time. There was no provision in the dam for boats to go up and down. I do not know when the dam was built. Mr. Norton had been there some years before I came. Shortly after I came to Lockport, merchandise was brought from St. Louis up to Ottawa by water and hauled from Ottawa to Lockport by wagons. The first merchandise I bought, I sent to St. Louis for. Went down to Ottawa in two-horse wagon, took the steamboat at Ottawa, bought all the goods I wanted in St. Louis, got it shipped on the steamboat and came back to Ottawa and from there to Lockport they were hauled by wagon.

Q. Was that the method that all dealers in Lockport used to get their goods from St. Louis?

Objected to as leading and suggestive.

A. Yes, sir.

Q. Was that the usual method of bringing goods from St. Louis?

(Same objection.)

A. The only method that I know of. I first went to St. Louis and bought goods in the spring of 1843.

I do not remember any dam in the river in 1841 besides the Norton dam at Lockport. There might have been some in Joliet, but I do not know anything about them. There was a bridge across the river from Lockport over to the bluff on the other side; that was existing when I came there. Bridges have been built since then. The bridge that was there when

I came did not have any provision for opening so that 1389 boats could pass through. I do not think any of the other

bridges that have been built there since have any such provision in them. I think the bridges that are there now are high enough for an ordinary boat with an ordinary mast to it, to pass along. I do not think that any boats, except skiffs pass under it. There is only one bridge now in Lockport crossing the river.

*Cross-Examination.*

I have seen skiffs on the river there occasionally. My youngest son has a boat as big as I ever saw on the Desplaines

at Lockport. It is just an ordinary skiff. It was given to him by some parties that were working on the big drainage ditch, and it is in my barn now. I mean to say that I never saw any boats on the river. I do not think there ever was any. I cannot say that there never were any but I say I never heard of any or saw any. I never knew of a boat on the river propelled by sails or drawn along by ropes along the side of the river.

1391 GEORGE F. GURNEY, a witness for defendant, testified as follows:

*Direct Examination.*

I live in Joliet. Have lived there since '94; before that I lived in the town of Jackson, in Will County. That is eleven and a half miles southeast of Joliet. It is seven or eight miles from the Desplaines river. I lived there over thirty years, came there in '64 or 5. I lived in Wilton, a town southeast of that, before I went there; first came to Will County in 1392 1845. I am 75 years old. I lived in Florence a couple of years; it is a town southeast of Jackson; there isn't much difference in its distance from the Desplaines river. I have lived continuously in Will County since 1845, excepting a short time, six months or less, when I lived in Grundy County, on the Mazon. My business has been farming. I have a farm in Jackson and Wilton in Will County. I was thirteen years old when I came to Will County. The farmers in 1393 Will County, in 1845, used to haul their products to market by wagon, to Chicago; they got supplies in Chicago at that time. Some were brought here to Joliet. I came to Will County in a boat from Buffalo to Chicago; from Chicago to Will County by team. I think I have been more or less familiar with the Desplaines river running through Will County since I came. I never knew of boats coming down from Chicago with merchandise and produce and carrying passengers, along the Desplaines river. Never heard of such a 1394 thing; never heard of any commerce of any kind being conducted on the Desplaines river by boats, either in high or low water. I came from Chicago to Will County in March. I think I know whether it was possible at that time to come down the Desplaines river by boat. The fact is, you

couldn't; no way of getting over the dam. There was a dam here in Joliet, and the riffles up from Romeo would break any boat. I know of other riffles in the river right below Joliet closer than Treat's Island. There were riffles below 1395 that clear down to Channahon; what you call Channahon bridge. They might call it Smith's bridge now; that is the only bridge south of there; below that there were not any riffles or shoals in the river; there was considerable rather dead water there. When I first came here to Will County, there was a little dam here in Joliet north of the Jackson street bridge. Below Joliet there was a dam at Malcolm's mills and at Treat's; there was a little dam there; they had a kind of saw mill. I do not know whether there was another dam in the river below that; there was a kind of a dam near the mouth of the river there, but I do not know whether it was recognized as a dam or not. In those dams that I know of, there was not any provision made for locks so that boats could go through them back and forth; not in any of them. 1396 I think there was a dam at Lockport when I came to Will County; I do not know to what extent; I saw but of course had no particular object to remember it. The bridge at Lockport was the only bridge, when I first came to Will County. There was some timbers laid across there at Jefferson street in Joliet. There was no provision in the Lockport bridge for turning the bridge so that boats could go through. I had occasion to cross the river hundreds of times during my early life. I forded it at Treat's Island and below Joliet, and at Smith's bridge as you call it. Those fords were at riffles in the river; very little water there in the summer time. You could not walk across it without getting 1397 your boots wet. I could go across without getting my feet wet, but I would get my shoes wet; go from one stone to another.

I have hauled produce to the Chicago market from Will County, two or three times; three times at the outside; that was before the Illinois and Michigan canal began operations; between 1845 and 1848. The roads were not good. When a man with a load got in a rut he stayed there; it was difficult transportation. I hauled produce back from Chicago every way.

1398 I recollect Haven's mill in Joliet. McKay built the mill on the side of the dam near Jefferson street. The Malcolm mill is where the Haven is. I worked for Haven's at this mill on the logs. The logs were hauled to the mill from



anywhere. Never heard of floating logs down the Desplaines river to that mill. They would run the water off in the spring; in the fall they had plenty of water to run. In the summer they had to run the water off, and then start up again. There was enough water to run the mill only at periods in summer; they would shut down probably over night for lack of water.

1399 I ought to be familiar with the old aqueduct that was built across the river down near its mouth, because I hauled their lumber there. I do not know that I could place the year; I think about '46 or '47; I hauled lumber there at the time it was being constructed. My recollection is that the stone to build the abutments for that aqueduct was hauled there from Alexander's quarry. I never hauled any for that aqueduct, but they had pretty fine stone, and that is my impression. When I speak of Alexander's quarry, I mean the quarry on the land that is now owned by Mr. George Alexander; his father owned it; it was probably 50 or 60 rods from the Smith's bridge. That bridge was at a point probably about a mile and a half below Treat's Island.

I helped haul stone from Alexander's quarry to the aqueduct at Aux Sable. I think some of the stone was used on the aqueduct where the Kankakee feeder is; probably not all of it. They had a quarry there below, but I was never down there to examine it, because I had no occasion to. Some said it was good stone; some said it was not. There was a quarry below on the Illinois river, just above the mouth of the Desplaines. I never heard of any stone coming down the river by boats for the aqueduct on the Desplaines or Aux Sable. From my knowledge of the river it might have been possible to have brought stone from Joliet down to those aqueducts. Sometimes they could have floated a little stone now and then. I do not know where they could, from any place in Joliet, get them to the river; they could not get them through Haven's dam, or the other dam in Treat's Island. With high water they might have floated over,

1401 but they could not get it in. I do not recall ever seeing any fence across the river below Joliet; there were fences along the river; there were fenced pastures the Smiths made. Folks made fences down into the river where the stock could not go around in deep water. They built the fences into the water a little distance, so the stock could not get around. Sometimes, but not very often, it was pretty safe to put them in there and keep them in there. The distance the fence would



be built into the water depends upon the condition of the ground, and the depth of the water.

1402

*Cross-Examination.*

In building these fences into the river they would go as far as where they would have to hold up their heads, 2 or 3 and sometimes 3 and 4 feet of water. Sometimes they would be right close to the edge of the water, 6 or 10 or 15 feet out, sometimes 20, sometimes more. The quarry I was speaking of above the conjunction of the Desplaines and Du Page rivers was above where the aqueduct is built. It is right  
1403 near the conjunction of the Kankakee and Desplaines rivers. Sometimes one could cross the Desplaines river

at the riffles with shoes without getting their feet wet by stepping from stone to stone, I could not tell you what portions of the seasons. Sometimes we would have a long dry spell and then it would be a good long spell you could do it. That place I am speaking about now, the station of the Santa Fe road is right opposite. It is above Treat's Island. Occasionally could do it here in Joliet. In high water there might be

7 or 8 feet, sometimes 5 to 10 feet. It would not be much  
1404 wider than the river is now, but it was on the flat lands.

It is a quarter of a mile wide, probably, sometimes; on the lowlands the river would flow out at times; there would be a depth maybe of a foot or 6 inches, maybe 2 or 3 feet. The channel where the depth was 5 to 10 feet during certain

seasons of the year I think would be 200 feet probably,  
1405 maybe not; I cannot fix it well. I would not think the bridge at Channahon's is 300 feet wide, barely possible it is 200. Could not tell you how deep water would be required to float a boat say 30 feet long by 10 feet wide, 3 to 5 feet probably, I don't know. Take it on these riffles where it

is rock, there would not be anything to cover those rocks  
1406 and if a boat struck the rocks she would be there sure.

Aside from the rocks, if there were no rocks to interfere I think from 3 to 5 feet of water would carry a boat such as I have described. I do not know anything about there having carried freight from Chicago or from the portage near Chicago on the Desplaines river down the Desplaines river and around to Kankakee on the Kankakee river. I have lived on the Kankakee river and the Desplaines from '52 or '53; I lived right close to the Kankakee at Wilmington; that is below Kan-

kakee City; they call it something like 25 miles. I lived  
1407 there two different times, the first time from fall to  
spring, the second time probably a year. During the  
first time I lived there sometimes it was frozen and some-  
times it was not. They used to ford the Kankakee with teams  
at Wilmington. I think I forded there and it was four feet  
deep. I could not tell you the depth. Sometimes it would  
be bare rock and then you would go into a hole, maybe a  
foot or two of water, while other places would be dry. I  
think it was '46 that I hauled stone to the aqueduct across

Aux Sable creek. There might have been a saloon a  
1408 quarter of mile or less from the river on Aux Sable  
creek; I don't know whether there was. There was two  
gangs of men working on the canal, one they called "far-  
downs" and the other "Tipperary's." When they got to-  
gether I saw them get to fighting. That happened frequently  
when they got whiskey. They would come to Joliet and get it.  
Aux Sable creek may be 20 miles or more from Joliet. I am  
sure that there were not some stone taken down from some-  
where there in a boat; I am sure there was not because they  
could not get them. There was no place to load it on. There  
was a stone quarry below the dam in Joliet. There was no  
way of getting them across from the quarry, is the reason I  
think there was none taken. I know where the first riffle in the

Desplaines river was about the mouth; I can't place  
1410 the distance. It would not be 2 miles there; it might  
be half a mile, more or less. I could not tell you how  
deep the water was on that riffle in low water season. The  
second riffle above the mouth is at Alexander's; my impres-  
sion is it would be about 3 miles from the mouth. You  
could cross it stepping from one cobblestone to another. In  
deep water probably there was 10 feet there. I remember  
one place the depth of the river above the mouth of the Du

Page and Kankakee, I would say it would be 15 feet,  
1411 once in 1848. The depth of the water on those two  
riffles I speak of was after the dam was put in here at  
Joliet. There is a third riffle above the mouth of the river  
before you get to Joliet, at Treat's. I have seen the water  
run up the river there from the Kankakee. I am speaking  
of one crossing place they call the cut-off. The water went  
through the Kankakee river through the cut-off, then ran up  
the Desplaines, or backed up, whatever way you want to say  
it. It ran up the current pretty nearly as fast as I can run.

That was quite a big body of water. I could not tell  
1412 you how deep. a big volume; I should say it would be as  
much as 10 feet, a big wave going right up, 2 or 3 feet  
of a wave. I say it run up 10 or 12 feet deep. All this was  
after the dam at Joliet was built. There would be another  
riffle down there at Brandon's bridge. It is about 2 miles  
down from the heart of Joliet, from Jefferson street.  
1413 I have crossed that riffle hundreds of times; sometimes  
it struck my knees, sometimes it was a foot and a half  
deep. I did not stop to measure it. I got across; never swam  
a foot in my life; I have sat on my horse and let him go  
when he had to swim. I should think the riffle at Treat's was  
a couple of miles up and down the river. The others  
1414 were not so long. This one at Joliet was all the way  
from there down to Brandon's bridge from the Jefferson  
street bridge down. I estimated that a couple of miles, more  
or less. I have crossed the place a number of times; some-  
times I might have taken off my shoes and waded across.  
One place I speak of having crossed it right here below  
Haven's mill. I could not tell how much water was there at  
that time; it was quite wide. Some places there would be con-  
siderable and some you could jump across, sometimes 2  
1415 feet probably, when I jumped from stone to stone. I  
never thought anything particularly about distances. I  
should think there is more water there since the water from  
the Sanitary channel has been put in. In my judgment, it has  
raised the water above what it was before about 3 feet.

*Re-direct Examination.*

I said that I helped haul stone from Alexander's quarry to  
the Aux Sable aqueduct it is on the south side of the  
1416 Desplaines. The quarry was on a different side of the  
river from the aqueduct. We just dumped the stone at  
the aqueduct. We loaded our wagons at the quarry, hauled  
the stone over to the aqueduct, had to cross the Desplaines,  
crossed it at Channahon's there was no bridge in those days.  
We did not take it over in boats, drove our teams and wagon  
right through the river. While we were hauling that stone  
across, the water would be up to the front wheel of the  
1417 wagon that would be something over three feet, three  
and a half may be. During the summer months over  
these stretches I have mentioned there was barely no water.  
Sometimes we would have very severe storms in August and

have very high water; that would last a week and then go down. In the spring under normal conditions anybody could go anywheres along these places, across in buggies or 1418 wagons.

Q. Had there always been fences running into the water there within your recollection?

Objected to as leading.

A. There have always been pastures and fences there within my recollection.

There was enough of a dam at Beard's near the mouth of the river, to prevent boats coming up the river.

Q. A boat couldn't get over it or couldn't go around 1419 it?

Objected to as leading.

A. Yes, that is a fact.

Q. These occasions when there was deep water in the Des-plaines river, was on one occasion in '48 when there was a flood, that was all?

Objected to as leading.

A. We had a flood there in '60, but in '48 was the time when there was a flood on account of the ice. This time in '60 something, was in August. Sometimes those floods take a couple of days to run down. There was never a time along the river when the water was 4 or 5 feet deep continuously for two or three months except since the Drainage Channel has been built.

#### *Re-cross Examination.*

This dam that I speak of at Treat's was only on one branch of the river, the lower branch where the water ran, about in the middle of the stream; the water was swift on the other side of the channel; I don't know how rapid, I never tried to run as fast or walk as fast; I never had any particular 1420 object to know how fast it would run. It was in the summer season in '46 or '47 I hauled stone down for the aqueduct at Aux Sable, I could not remember what month; it was in low season of water when we could ford it.

#### *Re-re-direct Examination.*

I do not know as I could state the year the state built the dam in Joliet at Jefferson street; that was not built be- 1421 fore I came to Will County. There was a dam there when I first came to Joliet. I could not remember when

the state built the dam at what is known as Jefferson street. It must have been '48 or '50, through there, before '50.

1422 XAVIER MUNCH, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Xavier Munch. I live at North Hickory in Will County, near Joliet; came here in 1839; have lived here pretty much ever since, not all the time. I was out west about a year and a half, but other times I lived around here. My business is farming. I had a farm in Will County. I bought one in 1848 or something like that, and another in '59. It will

be two years in February that I sold the last one. During the time that I had them I cultivated the farms. I was born the last day of July, 1823. I came here first with my father on the canal. That was in 1859. We landed first at Lemont, then in the fall made up our minds it was a kind of a lonesome place, so we came to Joliet. We came to Lemont from Chicago, walked out afoot; came from Lemont to Joliet, drove down in a wagon. We used to have to go to

Chicago; we could not sell produce here; go with oxen or horses; came back the same way; never came back empty, always had a load, lumber, coal, hardware, salt and such. I have been considerably familiar with the Des-1424 plains since I came to Joliet in 1839; we used to go fishing in the river. I have crossed the river a good many times since 1839; had occasion to go across frequently with teams.

I was down in Peru twice after sugar and molasses in 1425 1839 and '40. At that you could not get any flour by the sack; maybe go to the mill and buy a sack; otherwise folks would have to clean their wheat and take it up to the mill and get it ground. Merchandise dealers in Joliet got their supplies mostly from Chicago; all came by wagon; none came by boat that I know of; never heard of supplies being brought down from portage near Chicago by boat or Des-1425 plains river. I have seen some small boats, 4 or 5 men, and they would have supplies, guns and tents, to go hunting.

Q. Those were row boats, were they?

Objected to as leading.

A. Yes, boats with paddles. I never saw boat plying up

and down the Desplaines river carrying passengers or  
1426 freight never heard it that I know of. I never knew of  
any boat that went up the river, but have seen some com-  
mon row boats come down. They would get to a dam, pull the  
boat out on land and bring it around and drag it along and  
put it in the water again—row boats with paddles. I did not  
follow them to the riffles. When I came down here there was  
a dam on Jefferson avenue, a temporary dam of wood.  
1427 There was a grist mill; that was condemned by the state  
for making the canal. Down below about six miles there  
was a fellow had a saw-mill and a wooden dam, at Treat's  
Island that was clear across the north channel when they run  
the saw-mill. I do not remember any other dam below that.  
I do not remember a dam at the place we called Dresden, when  
I came here in 1839 I passed through at different times but  
I didn't see a dam there. I could not possibly say whether  
there was any other dam above Joliet in the Desplaines  
1428 in 1839, but I believe there was one at Lockport, a tem-  
porary dam for a grist mill. There was another dam  
opposite the penitentiary just above Joliet that I know of.  
There was one at Jackson street after 1839 that was built, I  
guess, in 1840, built by the state for the canal; it was run clear  
across the river. There is a lock and dam above. The dam  
extends the full width of the river. On Jefferson street  
1429 when they made the dam they built a lock in order for  
the boats to go through. The boats did not go up through  
the dam at Treat's Island before 1848. I never saw any going  
up never heard of any boats carrying freight and passengers  
going up and down the river. In 1839 there were dozens of  
places where you could get across the river, I mean in the  
spring of the year; you could ford it just below Jefferson  
street bridge; but the spring of the year if you had small  
boats you could get across. During the summer season, from  
the first of May until the first of October you could get across  
right above the Jackson street bridge, except during the high  
freshets; we used to drive through the river there; the water  
was possibly hardly knee deep, solid bottom, and through here  
on Jefferson street there is where the walking was most any  
time except in the spring when the water was very high. I  
crossed at Treat's Island; it was pretty shallow at the time  
I went, it was in the fall of the year, 1842; I went across  
1430 with a threshing machine. Could cross there at almost  
any time except during the spring floods. I crossed at



Treat's Island different times with a team, dragged some logs down to the mill, the mill of a man named Treat who had a saw-mill. Took logs from Mount Flathead, that is, near Rock Run. There was some canal timber there and the man bought a lot of timber from Prescott; I don't know whether he got it for himself. He hired me and my father, and we sawed the logs and hauled them out on the river and rafted them down to Treat's mill; that must have been two and a half miles from the mill. I never saw any fences across  
1431 the river; I saw some of them part of the way out, fences in there where the cattle run, but not across the river. That was, I guess, before '48. I had to do with the construction of the aqueduct at Aux Sable creek. I hauled timbers out there for Brandon for the aqueduct, 40-foot sticks. I do not remember seeing stone being hauled for that aqueduct it was in the winter time when I hauled the logs, hauled them from the Aux Sable grove, along the Aux Sable, mostly burr oak. I do not remember the construction of the aqueduct at the Kankakee feeder, but I know where John Treat had a little place right across the Kankakee, because I hauled a great deal of timber out of the Dresden timber for the canal and locks. I did not see any dam John Treat had there at that  
1432 time. Part of the time between Lemont and Joliet, when I moved to Joliet there was a good road. There was a time you could hardly get along, whether you went on horseback or not. After I came here I went to Chicago by road. When we had any grain to sell we couldn't sell it here and had to go to Chicago. I took oats to Chicago and sold them for 11 cents a bushel. There were no boats running. I don't know that I would know if there were any boats running up the river to the portage near Chicago if there had been boats. I never examined it all together clear up to Chicago, but many times I drove up there. One time I went up to Chicago, from Joliet with a load of wheat and had to follow a trail the same as a railroad you could not get out. The other road was cut up so that you would break your wagon down if you would get out, and you would just have to follow one after another to Chicago, and you would see now and then a loaded wagon laid aside of the road and a dead ox or horse. I never saw any farmer taking grain up to Chicago by boat before 1848; these hunting boats are all I ever saw.

Q. Those were merely skiffs or row boats?

Objected to as leading.



A. They were hunters, had guns and tents. People came from Chicago to Joliet either with ox teams or horse and team. There was a stage; that was here when I came. I could not tell you the name of the line. The stage master was a big, heavy man, I can't think of his name now I guess he is not living. I could not tell you exactly how often that stage ran.

I went up and drove four yoke of oxen to Ottawa with 1434 store goods from Chicago, and coming back I thought I would get in the stage and ride. I went to the stage hall, and he says, "About 7 o'clock this evening they have one going out." I says, "How much will you charge me to take me to Joliet?" He said, "\$2.50." Well, I had hired out to take these yoke of oxen down and I was only getting 50 cents a day I only got \$2.25, you see, and he wanted \$2.50 to ride on the stage, and I went back to the shop and bought me a pound of crackers and paddled for home again on foot. This stage line ran on down to Ottawa and Peru, through all those places. There was no other convenience for people wanting to go to Chicago from Ottawa. That was in about '44 when I went down with my ox team.

*Cross-Examination.*

1435 It must have been about 1844 that that man down the river who had the sawmill hired me and my father to tie up a lot of logs. We hauled them out on the river, on the ice, in order to fasten them together on the ice; then when the ice went away we ran the raft down to Treat's mill. That was on the south corner of Mount Flathead. Rock Run runs right into the river on the north side; I should judge it was about two miles or two and a half above Treat's mill. We hauled the logs together and laid them side by side and fastened them together and made a raft. There must 1436 have been about 30 logs, I guess. Some were 3 feet and some 3-1/2 feet thick. When we took the logs down, the water in the river might have been 7 or 8 feet deep. That was mostly in the fall and through the winter. When we had done with the farm we would go to the woods and haul wood and logs. We crossed the river at Brandon's Bridge. Sometimes the water was about knee deep, and others I crossed 1437 it when I was pretty near drowned. By knee deep I mean a foot and a half or 15 inches. It must have been 40 or 45 feet across. At the time I crossed with the rails, I

guess it must have been 100 feet wide. In high water  
1438 it might have been 60 rods wide; in low water I don't  
think it was over 40 or 45. I think the bridge there,  
Brandon's Bridge, is 120 feet long; where I crossed the river  
it was not as wide as that bridge is long. I said the stage  
line went on down to Ottawa and Peru, I don't know how far  
through. I went down to Peru, that is as far as I ever  
1440 went with a wagon; I could not tell you if it went to Peru.

There was not any dam down there at Dresden Heights  
in the early days that I recollect. I hauled teams there in the  
early days; was in Channahon over a week; that must have  
been '45. I boarded at Dresden and Morris. There might have  
been a dam there at that time, but I paid no attention to it,  
unless I was wondering whether the three rivers ran so closely  
together. I saw Beardstown and three large buildings, and  
so I was surprised that that fellow was across the river all  
alone by himself. I say I saw boats in Joliet going down the  
river at the old mill where they changed routes; four or  
1441 five young men in the boat. I saw some tents, trunks  
and boxes where they had provisions, and guns. The  
boat must have been about 20 feet, maybe 22, from one end to  
the other, on top I guess in the middle about 4 feet wide. I  
don't know how much water it would take to carry a boat 30  
feet long and 10 feet wide, with five tons on it. I was fishing  
on the river down at Brandon's Bridge, and when I got on  
the riffles I could hardly go with two in the boat. That  
1442 was in the spring of the year, about April, ploughing  
time. The boats I said I saw came from Chicago they  
said; they went down the river; I couldn't tell you how far  
they went. I could tell you pretty near what year that was;  
that was in 1840. I saw where folks had made a fence on  
pastures; I never saw any fence across the river; saw  
1443 the fences built down to the river, about 10 or 12 feet into  
the river. They built out far enough so the water would  
not give away, so that they would not have any water at all.  
Those were little pens out into the river for cattle to get water  
in the river in summer time. The place where I crossed  
1444 the river near Brandon's Bridge was about 40 rods down;  
I crossed about 100 feet above the bridge near Christmas  
time, crossed through the water. At that time the water was  
two feet and a half deep. I crossed at Treat's Island in  
threshing time, in September; took a threshing machine across.  
That was in 1842. They had threshing machines here in

1842; just a thresher and three men with a rake and fork to get the straw. It was on a wagon. We had a common

1445 wagon they were laid on and hauled it across that way.

The water might have been 15 inches. That was about in September; August is most too early to thresh; I think it was in September.

*Re-direct Examination.*

Farmers crossed when they had occasion there at Treat's Island; there was no bridge there. Down at Smith's Bridge they hauled many a cord of wood off the timber, crossing the river there. That was used all summer for that purpose, any time you wanted to, at Treat's Island and Brandon's Bridge. Transportation less than twenty-five or thirty hundred I hauled across there. That point we put the logs in for the Treat's mill, from that down to the middle is what is 1447 known as Lake Joliet; that is on the end of the lake.

These people that had the boat pulled it out on the land to get it around the dam and put it back into the river; they could not get over the dam. They didn't take the contents and packages out. There were three or four men, all had a hand in it; had to drag it only a few feet. That was the dam at Jefferson street. There was no dam down where the Haven dam is at that time. Philly Haven started the sawmill and he used stone out of the canal to make a dam. If you should show me that that dam was built in 1839 I would not believe it. I think Haven built his dam in 1840 and used stone that Mr. Beemer had taken out of the canal to make that dam; it was later than 1840. I worked in 1840 for Beemer on the canal and this must have been in 1841. I think I saw this boat in 1840. I was not in Joliet sooner than 1840. I never saw 1449 a dam above Joliet opposite the penitentiary. I said that at the crossing at the point now known as Brandon's Bridge the river was about 45 feet wide in the summer time. I meant feet, not rods.

*Re-cross Examination.*

I hauled this threshing machine across below Treat's mill. The water was shallow. Go anywhere over there, there was no bridge, only to be looking for the nigger-heads, not to run against them.

JAMES BOYNE, a witness for defendant, testified as follows :

*Direct Examination.*

My name is James Boyne; live in Joliet; have lived there about 60 years. Was born the 2nd of August, 1835. I think I was 10 or 13 years old when I came here. I came from Cornwall, Upper Canada, by boat across Lake Michigan to Chicago and from Chicago down to Joliet. To Joliet we  
1451 came by wagon or boat, I forget which. I came from Canada in 1834. I came to Joliet I think about '34 or '35, I can't remember; my memory is bad.

1452 Q. 1844 or '5?

A. 1844 or '5. I am 73 or 74 years old. I have lived here in Joliet about 60 years. My business since I lived here has been wood turning. I am familiar with the Desplaines river. I have been up as far as Chicago and down. I have been as far down as Treat's Island. I came from Chicago to Joliet by wagon. There were not any boats plying the Desplaines river at that time I know of. I did not hear of any boats carrying passengers or freight. The first  
1453 two boats that came on the canal were the General Ply and the General Trenton. I never knew of a boat on the river except skiffs. The dams in the river when I came were Treat's and Haven and the upper bridge here, Jackson street, and there was one at Lockport. I do not remember one being opposite the penitentiary. In the early  
1454 days the dealers got their produce by wagons from Chicago. I do not remember any coming from St. Louis.

It could not come down the river, because the river will not carry a boat. I have been over the river thoroughly. I have waded across it for miles up and miles down. I have been up and down from Lockport, but the depth of river there I don't know anything about. I am familiar with it as far as Haven's dam thoroughly, but I would not say I was familiar with it from there down to Treat's. In the summer months it was very dry; at other times there was plenty of water; in the early part of the year there was plenty of water, but there was a great deal of dry time. When I worked down  
1455 at Haven's dam, I worked there I think about eight years, the water used to be so low that I could not run, and then it would be so that it bothered us. There would be freshets during the summer months, when the water would

be high; that would last along perhaps a weeks, a couple of weeks at a time. I considered the general condition of the river during the summer months from May 1st to October, with the exception of freshets, was low. I could wade across it below Jefferson street bridge. There was not a number of fords; I do not remember the ford at Haven's dam. I could cross there at Bush's where the bridge is now. There was an island there. I could wade across there and below quite a distance; that is, just below where the Jefferson bridge now is. I do not think there was a regular ford there 1456 where teams crossed. I think there was a bridge. I never saw any boats used for commercial purposes come up and down the river; I never heard of any for that purpose.

Q. Skiffs could not be taken clear up and down the river without portaging them?

Objection by counsel for complainant to the question as leading.

A. No, sir.

The WITNESS. From my familiarity with the river a man could not always take a skiff all the way up the river. When I could wade it, it would be about 16 or 18 inches, and you could not run a very heavy boat over that, and you would be off and on the rocks; you would have to stop and carry 1457 the boat. A small skiff might run. I waded the river time and again from one bank to the other. The canal commenced long before we came here. It had stopped then. When it commenced the second time we were in Lockport.

I would be 72 years old—I could not be positive what my age is; my memory is very bad. Going back to the early 1458 days, some things I remember and some things I do not.

I remember the Irish riot with the Orangemen, such things as that. I was able to wade this river different times; as a general thing the water was about 18 inches then, and you would run across a hole about 15 feet deep; there I would not try to wade it. When I said that this river was 1458 not navigable and is not to-day I meant that there is not five six feet of water in it. There is at places. I would not like to consider a river navigable unless it had four or five feet of water; that is what I mean when I say this river is not navigable. When the water was very low in the river it would run from a foot and a half to two feet. I am accurate about a great deal of this, but there may be some things that I may not.

*Re-direct Examination.*

Q. When you say that the river was not navigable, you meant, didn't you, that it never was navigated for commercial purpose in your recollection, is that right?

Objected to as leading.

A. That is right I never knew of it being navigable.

1460

*Re-cross Examination.*

There may have been boats coming down from Chicago toward Lockport. If a boat could get along on 2-1/2 or 3 feet of water it could have come down this way, but a loaded boat would not be apt to do that.

1461 LEWIS K. STEVENS, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Lewis K. Stevens.

I live at 203 Oneida street, with Charles L. Stevens, my son, in Joliet. I was born here, right over east; have lived here since 1836. At present I have been in mining in the west.

For the last eight or ten years I was farming and working in the stone quarries, and all that kind of work; contracting a good deal through Joliet. I have been living here you might say continuously all my life. I would be away off and on business and back again, but it has been my home. I don't live now in the same place where I was born. I am living on the west side. The E. J. and E. yards are our farm where I was born.

I remember merchandise and produce was brought to Joliet prior to 1848 with teams, as a general thing. I don't know of any other way to get it here. I know of produce being hauled between Joliet and Chicago at that time.

I was 12 years old in 1848. You understand that I am speaking now of the time of the commencement of the operation of the Illinois and Michigan Canal. People would travel in wagons in those days between Joliet and Chicago. There was not any other usual or customary method of travel between Chicago and Joliet in those early days.

There was wagon, and stage and horseback. There was a stage line running through on the west side of the river down from Chicago. It came down and went through to Ottawa. I don't know whether it went further south than Ottawa. I didn't travel on that line, or the stage; had our own teams.

First time I ever went to Chicago was in 1843. Went with a wagon load of wheat, and brought back some salt and a little lumber and other things that father wanted at that time.

1464 I went with my father. I went there a number of times, every once in a while, with our team. After they commenced to operate the canal there was not a great deal of teaming. There was some even then, but the canal would do most of the freighting. Before the commencement of the operation of the canal there was some teaming to points on the Illinois river,—not a great deal. They brought goods from the other way.

Q. Wasn't there a good deal of merchandise brought from St. Louis?

Objected to as leading.

A. Yes, sir.

There was stuff brought from St. Louis clear to Joliet. Before the canal it was brought with teams exclusively, as far as I recollect.

I didn't personally know of any merchandise or commercial articles having been brought up from the Illinois river to Joliet along the Desplaines river. I never heard of any boats plying along the river south of Joliet and used for commercial purposes, either in the transportation of freight or passengers, along the Desplaines river; nor of any plying between Joliet and Chicago. It would be an impossibility. I never personally knew of any such boats being operated on the river. Never heard from anybody in whom I had confidence, or from old settlers who lived there that there was any boats used up and down the river for commercial purposes. I am personally familiar with the river through Joliet and a little below Joliet and up to Lockport and Chicago. I have crossed the river a number of times and been up and down it on the banks.

1466 I know the general condition of the river in different seasons and the current; knew the condition before 1848. The condition generally of the water of the river during the summer months between May 1st and October 1st, as to the amount of water, would vary a great deal. Some seasons that



I have known the river you would not know that the water run. You could walk over the rocks; it would seep through; almost dry in places. There would be very little water in the river at times, and then wet seasons there would be water and floods, and there would be a great deal of it coming down from the side-hills all along up and down the river. I don't remember any season when the water of the river was high all during the season.

1467 There were several places we forded the river; when we went in about Washington street, here, and crossed the river on the island and went through there,—that is here in Joliet. Up a little this side of Lockport, there was one. We owned that; owned the old Norman property there. I have forded the river there a good many times. We had 250 acres of land in the town of Lockport. I forded it a number of times right west of Lockport. There it was very shallow. At Lockport they drove right through. The one up there at Norman's was only teams going in for wood. The one here at Joliet was a regular ford for teams,—a regular wagon

1468 road across the river. There was not very heavy loads drawn in those days. That was the only means of crossing the river prior to 1848, until they built an old bridge at the island. They had a bridge there before that time,—kind of an old wooden bridge. This ford was commonly used during the entire summer season,—quite a little traffic over it. There was not much current. There would be places there where there would be riffles, but there was not fall enough to make any great current. There was not fall enough from the Chicago down here to make any current,—never was.

1469 The water will stand along in pools and run slow. There would be a little current where the riffles were, but nothing very swift,—only in high water,—then it will rush down. From here up, there was but very little current. There was a little from Lockport down, but take above there, there was hardly any current; in fact the water would run back the other way sometimes,—when the water got high in the flats and the heavy water would flow into the lake.

Where those riffles were, the normal depth of the water during the entire summer season would be from 4 inches to 2 feet. I have driven right through where the riffles were and ridden through on horseback; never walked across. I could have gone through because at some places it would not be

over three or four inches deep. These places were at  
1470 the riffles. The one at Lockport there might have been  
four or five rods wide,—about four or five rods up and  
down. That one at Joliet near where Washington street is  
was shorter. It dropped down a little ways and then there  
would be holes there,—that is, where the island stood. There  
were some riffles below, but I was never familiar with them.

I know of riffles down near where Brandon's Bridge is. It  
was not very extensive in length,—10 or 15 feet long, I guess.  
That was a place where they crossed there. At that time it  
was called a regular road. Of course, there was not so much  
travel there. They did not use it much.

1471 I never traveled much through there where Treat's  
Island is. I never paid much attention to that. It was  
out of my range. I never saw any boats going up and down  
the river over these riffles. It was not possible for boats to  
go up and down over those riffles and float all the time. You  
would have to drag them in places. I never saw any boats of  
any kind in the river, except little row boats, that they  
dragged down and went fishing in. We had to drag it out  
around the dams and places of that kind.

Prior to 1848 there was a dam in the river here at Jefferson  
street in Joliet. The old Malcolm dam down below here re-  
mained there until the Drainage Canal took it out,  
1472 bought it of Adam, and took it away. That is the dam  
that is spoken of as the Haven Dam. I guess it is just  
south of the city limits of Joliet.

There was a mill at that dam. There was another dam at  
Lockport just west of there. The Norman Dam was this side  
of there. That was the old Daggett Dam. Daggett got it  
afterwards. It was Norton's mills. The Norman Dam was  
situated on the property father and Goodspeed got of Nor-  
man afterwards.

The Norman Dam was in the Township of Lockport, about  
a mile above the prison, on what was the old Sanger farm.

They were all in the river before 1848.

1473 I don't know there was a dam at Treat's Island, only  
from hearsay. I never saw a dam there. I never was  
down the river near the mouth, at the place called Dresden  
Heights in the early times. I was there somewhere along in  
'62 or '3. I don't know of my own knowledge that there was  
ever a dam down there. I have heard that there was; that is  
only from hearsay.

1474 All these dams that I speak of being in the river before 1848 were clear across the river. There was not any way whatever in which boats could go up through those dams. There were very few skiffs used in the river before 1848 that I know of. Some young people would go fishing or hunting, or something of that kind. That is the only purpose I ever knew it to be used for.

I was up at this island between Joliet and Lockport, a-fishing and hunting there. We had a boat. We were up the river at what they call Lillicache above Lockport, and part of the time at this island above the old Norman property. I paddled around a little there, fished some and killed ducks in the early days. I never did much of that. I was generally busy on the farm. I was not much of a hunter or fisher.

I have never known of the river being navigated by boats for commercial purposes since 1848. It could not be, on 1475 account of the dams. It would not be possible for any boats used for commercial purposes to have gone over these riffles during the summer season, at the normal stage of water. If there had been no dams there, it would have been impossible in my judgment to have navigated the streams.

We had a fence across the river at the old Norman place. We had wire stretched across and boards hung down in. My father and Judge Goodspeed owned the land on both sides of the river. I don't remember the section but it was in the Township of Lockport right above the town line, and took in the island. There was 250 acres. It was this side of the 1476 Lockport Dam; must have been a couple of miles. It was the Norman property. There was part of the dam left there, but not very much. It was only across one branch at the head of the island.

The fence crossing the river was below the dam and then it ran around up to the dam. The fence was put there just to keep a little stock in there. I cannot say exactly when it was constructed. I remember father sent me up there one time to look after people that were stealing timber off of it. That must have been between 1845 and 1846. I was quite a boy. There was a kind of a fence there then, mostly brush fence,—except across the river,—just enough to keep stock in 1477 there. There was some of the old remnants of the fence there then. I think it remained there some fifteen years afterwards. It was fenced in around there on that flat,—in

fact has been fenced more or less from that day to this. There would be times that they had wires across the river. I don't know but there may be wires there yet. I don't know of over one or two other fences there. Of late years there has been more at the pastures up through there by Allen's property and Fitzpatrick's, that was this side and the other side of Lockport Road, which runs right west of Lockport.

1478 These other fences that I spoke of were between Joliet and Lockport, and I think there is a fence or two above the road on the other side of Lockport.

I cannot remember any special fence,—only the one on

1479 our own land there. The fences were put in there after the canal was built. It must have been in 1848 or 1849. I was up there last year, and there were some fences, scattered through there then across the river. This is where the old river used to be there then. Since they have opened the Drainage Canal,—the river-bed was on the west side of the canal;—that is where the fences are across the bed of the river. You see it is not the present bed of the river. They are on the west side of the bed of the river now, but the old river-bed used to be west of that. They have changed that since they have cut the Drainage Canal through and left the old river-bed on the west. The fences established on my

1480 father's land was where the river ran in olden times, not where the river runs now. The fences other than the fences on my father's land were across an old abandoned bed of the river after they started this Drainage Channel through there.

Q. But when the fences were built it was the river?

A. It was the river.

Motion to strike out, question leading.

The fences were maintained up to the present time because there is no channel there. The channel was not changed until they built the Drainage Canal; that was about 1899. These other fences were maintained across the stream where it was flowing prior to 1899, ever since I can remember.

### *Cross-Examination.*

I have never seen any commercial navigation on any part of the Desplaines River. Have not seen anything hauled up or carried on boats on the river, or any stone taken down the Desplaines River on any boat, to be used for improvements.

I am not the gentleman who made a statement here a few days ago concerning what I have seen hauled on the 1482 river. I made a statement that I had seen a dock below here, but what it is for, I don't know; but not any boat or any stone on a boat. They asked me if I had seen a dock, and I was sworn to it in Mr. Chaney's office. I thought of it afterwards what that dock was built for. That dock was down at Brandon's bridge. It was some stuff thrown up there that looked like a dock, but in my inquiries since, they would cut wood and throw it on to that place and draw it away in the summer time. When the lake was frozen down there, they would run the wood across and pile it up. This was down near Brandon's bridge, a mile, or a little over, below Joliet.

I don't know anything else I said in that statement I 1483 swore to the other day; only I had seen a dock there. I told them I had never seen a boat or craft of that kind. I think I know what a dock is. That was not what you call a dock now. It was what you called a dock in those days. A dock in early days would be a log thrown down any place to tie a boat to. Its proportions were not such as to meet the ideas of a dock to-day. There was no snubbing post or anything of that kind where a boat could be tied. They could tie it to the logs that lay there. It could be used for a dock, 1484 but you would not call it a dock at the present day. I said it could be called a dock, but I did not say it was one. I do not think it was a dock. I did not testify the other day that it was a dock. I said it was some stuff piled up there that looked like a dock. I did not state in my affidavit that it was a dock. What they put there I don't know. I 1485 told them plainly that it looked like a dock. They read the affidavit over to me. I did not have my glasses. I cannot think of the man who prepared the affidavit. He was in Chaney's office. Claire took the affidavit. It was not Stevens. I think it was Purkheiser. I did not go there and tell him what the facts were. They asked me and quizzed me in every way, and I told them plainly that I knew nothing 1487 about anything of the kind. They asked me if I could make an affidavit that I had seen something like a dock there, and I told them that I could do that if there was something thrown in there. I talked very plainly to them,—just as I am talking to you; that I thought it was outrageous to think of a boat being there; that they had lived there just

like myself, and I had never seen a boat going up and down the river. I told those gentlemen all the things that I have just now been relating in regard to the boats, and things of that kind, and the dockage. I did not say in that affidavit that stone were taken down the river in a boat. I told them plainly I never had seen a boat on the river. I did not on the occasion,—when I talked to those gentlemen in Mr. Chaney's office and when the affidavit I have mentioned was prepared and signed—state to them that in 1835 rock was loaded on a boat and sent down the river. I did not state to those gentlemen on that occasion that stones were quarried near the river  
1488 and loaded on a boat and sent down the river. The names of the gentlemen present in Mr. Chaney's office on the occasion I made the affidavit I referred to, were Mr.  
1489 Chaney, Mr. Reiley and Mr. Purkheiser, I think. Those gentlemen were all present when I said on that occasion whatever I did say,—all except Chaney. He came in to take the affidavit. I might have said some things when he was out. The others were there when I went in and after I went away.

What I stated to those gentlemen was true as far as I  
1490 am concerned. It was true the way I understood it. I have not taken any interest in this lawsuit. Yesterday  
1491 was the first time I ever was introduced to Mr. Munroe.

I had just a few words with Mr. Munroe yesterday; no talk at all; simply if I could testify in regard to the river being navigable. I told him I could testify to what I knew about it.

I had a little talk with Kercheval, my cousin, about what I was going to testify here; Charles Kercheval,—I talked with him the day before yesterday first. I don't know any-  
1492 thing about his taking some interest in behalf of Mr.

Munroe or the defendant in this case. Only he telephoned me and wanted to know if he could see me, and he asked me about it. We talked over about the river. He and I agreed. I did about as much talking as he did. He did most of the talking. He asked me what I knew about it, and I told him. He asked the questions and I answered him. I know he and I agreed because in talking it over we agreed on those points in regard to the river and the boats. I did not agree anything with him what my testimony should be to-day. He

did not ask me if I would testify here to these matters.  
1492A He telephoned me and asked me if I could be a witness in this case. He did not ask me if I would testify to any particular things.



In regard to the navigability of the rivers, he asked me if I could testify to them, and I told him I could most certainly, what I knew about it. There was not any suggestion made by either of us what the answers would be.

We talked about the riffles and dams, and things of that kind. He mentioned some of them first, and I mentioned some of them. We were comparing notes, how it was in past times. I remembered some and he remembered some, and I have testified to all that I remembered and all that he remembered.

I was born right here east of Joliet, about a mile and 1493 a half. I am in my 72nd year. I did not do much fishing and hunting in my time; was generally busy on the farm. Never even ran a row-boat myself. Did not do a great deal of business on the water.

The fences I spoke about that was across the river at my father's farm, was a wire stretched across and then some boards hanging down from the wire. That constituted the fences. The wire was perhaps two or three feet above the water. It would perhaps not be more than a foot above high water. The water has a wide scope in there. The river 1494 was not so wide, but the lowlands were a mile wide there.

The river there was perhaps 6 or 8 rods wide. That would be from 100 to 130 feet. This wire was stretched across there. The boards suspended from the wire were little poles and hung down there. I could not say how long they were,—perhaps 6 or 8 feet, perhaps 10 feet.

This wire was stretched at high water perhaps a foot above the water; in very high water it might run over. They did not reach to the bottom of the river. They hung along 1494A lengthwise, and the water would swing them back. If those poles were from 6 to 8 or 10 feet long and from 1 to 2 feet above the water, the water must not necessarily have been from 4 to 6 or 7 or 8 feet deep. The water down below is not so very deep. It was perhaps a couple of feet deep. When it raised it would be deeper. In low water, the water was probably 2 feet deep; in high water it probably would have been over the top of the wire. In low water it was perhaps 4, perhaps 5 feet above the surface of the water.

1495 As near as I can remember, it is right that, in ordinary high water, it would be within a foot of this wire, and in low water when the water was only about 2 feet deep, the wire would probably be about 5 feet above the surface of the water.



I have answered that boats could not have gone up and down the river because of these dams. It was because of the water also. I don't think there would be water enough in places. At some times and in some places, I don't think there would be water enough,—I mean riffles. I have seen the time right here in Joliet that the water would stay back and would not run over for a week.

I think for commercial navigation that there should 1496 not be less than 4 feet of water. I think you could not navigate a river with less than 4 feet. I say in going on the river there would not be enough water there,—I say it on that account—not above 4 feet. But when we have 6 inches, I have seen the river when there was not more 1497 than 6 inches, and I know it could not be done in 6 inches. I mean on the riffles all along the river. I don't mean literally "all along the river,"—I mean where the boats would have to go through in the river.

It is true that in a good many places the water is 10 or 12 feet deep on this river. It is also true in certain seasons on the riffles it goes down to 6, or 8 or 10, or 12 inches, and where it don't run at all. It runs underground, seeps through. 1498 I literally mean that it don't run above the surface at all. I mean it runs between the rocks wherever there would be holes. I have seen that kind of a thing in places where the water was 2 feet deep. It would be where you had rocks and gravel. If there was rocks piled up and water two feet deep, it might be a lot of little rocks and gravel. I 1499 mean to say that in the Desplaines River gravel and rock were piled up by nature, washed there, so that they would constitute a riffle. The water runs through pretty deep sometimes. There would be gravel and stone,—no telling what kind of a riffle there would be.

I mentioned three fords in the river: one right west of Lockport, one near here on the Norman property, and 1500 also at Washington—Jefferson St. Take Brandon's bridge, I forded there some. In the summer time when I went through there I crossed when the water would be about 18 inches deep,—probably a foot to 18 inches. Lockport, I went there when it was not more than 6 inches deep over the ford; the two other places down there perhaps a little deeper. It might have been two feet deep in the deepest places at Washington street. At Norman's we went through there and there was no regular road across the river any place

there. It would be a foot to 18 inches in the summer time, at low water stage. There was no regular ford there,—that was our land. We would just go across ourselves.

1501 I said there were perhaps a dozen times I went fishing. There was a number of times, perhaps a dozen times in my life. I was with some parties at one time, and we had a skiff up there, a little row boat, a paddle boat,—pushed and paddled down and shoved it along. I said I did not remember how many times, several times,—perhaps a dozen times. I do not know what I said in my direct examination. I said there was not much current in the river.

1502 I am referring to the current above. I said there was more current below than there was above. It dropped sometimes,—say go for several rods and then it would drop 6 or 8 inches. It did not drop very much.

I mean by the current, where the water descends a little, where there is a descent in the river; that is what makes the current. It is the moving of the water,—the speed of the water in the river. The current was very low on the riffles because there was not flow enough to make it. It was not very swift,—pretty slow. I never figured on the mileage, or

1503 anything of that kind. I don't know if it was running 15 miles an hour,—perhaps about a mile an hour. There were places where it might have been a little faster than that,—I would say at the rate of two or three miles an hour, but not very swift.

The ford above Lockport is above the dam,—above the Lockport mill. It is perhaps one-half a mile. The dam is not more than four feet high,—four or five, I don't know what it is now. At that time it was about four or five feet. At the ford above the dam the water is clear down up there in the summer time. It would not be six inches. The water was not backed half way up to the road. It was backed up one-fourth of a mile, so the ford is clear above in back water from the dam.

1504 There is a dam at Jefferson St. just a little above the ford at Jefferson street in Joliet. I think it was perhaps three or four hundred feet. There was no regular ford there at Norman's,—just rode through the river at different places.

The fords I mentioned in direct examination were: one at Lockport and the other at Norman's this side of Lockport, a couple, or three miles below Lockport. This one was not a regular ford. Two of them were regular fords; and then the

one down at Brandon's bridge was a regular ford. At  
 1505 Lockport, I don't think I ever saw it at high water, over  
 five feet above the low water mark. Those other places  
 it would be a little more. I have seen it when it broke down  
 through here; it would raise 6 or 8 feet here in Joliet. I don't  
 know that I stated anything that one month at a time during  
 the summer time there was deep water. I have not any spe-  
 cific recollection of the year 1876. I was living in Chicago  
 went up and down here. I knew there was considerable floods  
 here. During the summer months,—May, June, July and  
 August of that year, I am of the opinion that the river could  
 not have been very high. There might have been plenty  
 1506 of water in it, but spread around a good deal. I knew  
 there were times that the river did flow out of its banks  
 run around through Spring Creek down over our farm. I  
 don't just have in mind what time it was. There was more  
 water in the river as a general thing during that whole sum-  
 mer season up to September. I cannot say in regard to  
 1507 whether there was four or five, or six or seven or eight  
 feet there in that year.

It was along in the spring, in June, I think, the times that  
 I was fishing in a boat up there. We went out into the ponds  
 into the river; the ponds through the river. We took the boat  
 in a wagon when we went up there,—just fished around there  
 where we thought there was fish. We hunted deep places in  
 the river to fish. The water was five or six feet deep where  
 we were. That was below the Lockport dam,—perhaps a  
 couple of miles, this side of it; and another time this side of  
 the dam up above Lillicache. It was this side of the Norton  
 dam below it. I was close to the old Norman Dam, was up a  
 ways.

*Re-direct Examination.*

1508 When we went fishing and took the boat in the wagon  
 we took it from Joliet. We could not take it up the river  
 very well. We could drive it down to where we wanted to fish  
 and get out on the pond. We took the boat back on the river  
 sometimes. That must have been after the canal was built  
 That must have been in 1849 or 1850.

1509 My testimony that the current was not very swift over  
 the riffles applies to that part of the river above the dam  
 and below the dam; where the water was running that would  
 give it a momentum. The water coming right over the dam  
 might run at the rate of 40 miles an hour. It was swifter be-

low Joliet than it was above. When I was down at Treat's Island it was swifter a little down there than it was this side. There was a place down near where Smith's bridge is now that was pretty swift. I never noticed the current much below there.

1510 I spoke of poles that were attached to the wire fence across the river at my father's farm. There would be a wire across and then they would hang some light poles on, and the poles would hang down below the bottom of the water. When the water would run it would swing them up. The poles were loose at the bottom to keep the cattle from going in.

I did not mean to say that I agreed to testify to what Kercheval remembered. What I have testified here is what I remembered myself. Kercheval asked me my remembrance on things that I would remember. He would talk just as any man would about the circumstances of the river at that time. Of course, it brings things to your remembrance that you would not remember if you had not talked about it.

*Re-cross Examination.*

1511 Where I said the poles went down below the bottom of the water, I did not mean that I meant down below the bottom of the wire. It went down below the top of the wire in high water and below the water always.

This skiff that we went fishing in was a little boat that we put on the wagon. It was 10 or 12 feet long. It would weigh about as much as a common wagon box. Two of us would be in at a time of a fishing expedition. Our taking it in a  
1512 wagon was simply an expedient way of doing it. We put it in the wagon and drove it to the fishing grounds. That is what we did it for.

I think I said the river at the place where the wire stretched across it was from four to six rods wide.

Q. Did you not say six or eight rods, and I reduced it to feet, and you said 100 to 130 feet? What is the truth about it?

A. You said about 100 feet, if I remember right.

JACOB ADLER, a witness for defendant, testified as follows:-

*Direct Examination.*

1513 My name is Jacob Adler. I reside at Joliet. It will be 70 years next spring since I came here the 17th of March. I will be 72 next March. I came when I was two years old. I have not lived in Joliet continuously. I lived up at Hickory three years after we came here. That is what was New Lenox, in Will County, six miles from Joliet. Then we moved from there. I bought a place down next to what we call the edge of the lake,—Brandon's Road as you probably know it,—on top of the bluff, about two miles south of Joliet I guess. During this entire seventy years I have lived in Will County at these three places.

I was a farmer until I was 20 or 21. After that I went to Pike's Peak in 1859, then I came back and started a butcher business in Joliet, that was in 1860. I have been in business ever since. I have retired. I am with the boys, but I don't do anything much,—only go and see the pasture and cattle, and sometimes I go out and buy. That was my father's farm where I farmed up to the time I was 21. It was about two miles south of this; south of where we lived, down near by the river,—that is south of Brandon's Road.

1515 The first farm where we lived was along the river, part of it was to the river. In the early days we dassent go on the prairie because there were so many sloughs. We could not get to town, there was no bridges. At that time none of the farm lands laid on both sides of the river; since that time,—I think about 1860, I bought one and a half miles along the river on one side. I rented some on the other side,—about a mile I think it was, sometime in 1865 or 1866. I still own some of the land that I bought, but I sold some of it. I pastured some of that land after I went into the butcher business.

I have known the Desplaines ever since I was six years old, when we moved there, and I have known it ever since. I had pastures that I bought there somewhere along in the '60's. I was familiar with the river ever since and before that. I  
1516 lived I guess within 80 or 100 rods from the river. I was familiar with the river before the canal commenced operations in 1848. In 1848, I don't know of any more dams than up town here. I was driving cattle up to Lockport, and I saw

the dam there, that they called the "Old Daggett Dam." The dams that were built in the City of Joliet were built before 1848.

I think there was what you call the Haven dam, and the dam at Jefferson street, and the upper dam. The upper dam is 80 rods above this dam here on Jefferson street. It extended clear across the river. There were no mills on those dams, but at that time there was a mill down here that we called the Havens mill. There was a dam there. I think that was first a sawmill and then after while they built a grist mill.

I saw a dam at the north end of Treat's Island; I could 1517 not say when I saw it first. I was a boy and we went down. Our cattle ran that way sometimes in the spring of the year, and we went down and I saw the dam there. I think that was before 1848. I don't know that there was any dam further down the river nearer its mouth in those days. At Washington street there was an island there, and there was a bridge from one island to the other, and then over to the other side. At that time it raised it over the canal. That was some time when I was 8 or 9 years old,—I guess that was before 1848.

There was a bridge down there at Brandon's, what they called the Brandon road; I forget when that was built. There were piers in the middle of the river, and then there were logs 1518 on it and boards, and we went over it. I don't know when that was built. These dams that I have spoken of were not so constructed that it was possible for boats to go through them. I was not familiar with the river above Joliet in those days, more than sometimes I went up there to get cattle.

I think what you call the Daggett dam was there before 1848. It is southwest of Lockport. I don't remember a dam called the Norman dam near the penitentiary, where the penitentiary now is.

My parents came to Joliet or Will County driving with a team. We moved from Chicago in the spring to Indiana, and the same summer we moved with the team up here between Lockport and Joliet. During my youthful days I had occasion to go to Chicago from Joliet. Went by ox team. Went up 1519 there to sell our wheat or corn and then we would bring provisions back. That was the customary method of the farmers at that time in taking product to Chicago. There was not any other method that I heard of or know of.



I never knew of any boats being navigated up the Desplaines River from Joliet to Chicago carrying produce, merchandise or freight. Never saw a boat on the Desplaines operate for the purposes of commerce. I never saw any boat on the Desplaines other than a skiff. Never heard of any. Never heard of any freight or merchandise or produce being brought from points on the Illinois River to Joliet by boat along the Desplaines River. Not more than what I heard said.

Q. What did you hear about that?

1520 Objection by counsel for complainant.

A. I have heard them say that they came up as far as La Salle, and the time they were building the canal that they brought stuff over that way along the canal with teams.

The WITNESS. I heard that at the time they were building the canal. I never heard of their coming over to Joliet that I know of. When I was a boy it was not possible to navigate boats up and down the Desplaines River between its mouth and Chicago.

In 1870, or something like that, they pumped in the water from Chicago. The water came down the river and made it bigger. Before that water came down, the main river was very little, when there were dry times. Then there was a little water running over the stone in the riffles. After they pumped that water down the river got bigger on both

1521 sides and the brush and trees died from that water, and it was pretty near all brush on both sides, so that the boats, if they would come up the main stream when the river was high, would run over on this corner, and then after a while run over on the other corner, and run through the brush.

Q. So it was impossible to run them?

Objected to as leading.

A. It was impossible for any boats to run up and down. There was no boat could go up in these riffles, even in high water, and the currents would strike and go straight across through these trees and brush. You could not go down the river. If you would have a boat go down the river it would run on this brush.

In my boyhood days we got across the river by fording it. The main ford was about one-fourth of a mile at the edge of the lake, what they call Joliet Lake, at Brandon's  
1522 bridge. There was a ford that came down and went over the river that way and went up across the other side where the bridge is now. There was no road. That ford was



the regular road. Later all those Truman folks down there used to drive over that way to Joliet. We have taken heavy loads across there. Brandon used to cut their timber on this side. They used to tee across that ford. When there was a freshet there they could not go across. They pumped that water into the canal and sent it down. If it rained a good deal the river was big, and if it did not rain, in a few days—a week or two—the river would be low. At that time the river was not wide, but when it was big it flowed over, probably a half mile wide. When it was dry it was probably 100 feet wide.

1523 In the summer seasons when there was no freshet, usually you could walk across it on the riffles with your boots on the stones. It just seeps through. That was before this water came down where they pumped it in. There was one riffle right above Brandon's bridge. I suppose it was probably 100 or 200 feet. There was one right next to the lake there we used to go over with our boots on in low water; that is, just below Brandon's bridge where they forded.

I have known other riffles down near the point where  
1524 Smith's bridge is. I crossed there. There was a riffle below Treat's Island, which might have been two or three hundred feet. I drove cattle across back and forth. There was a regular wagon road across there. I think there was a riffle above Treat's Island next to the lake. There was a ford just below the bridge that went up on the towpath.

1525 That is the bridge now known as the Jefferson street bridge. They drove backwards and forwards there.

I have been on the river in a skiff,—a little canoe boat fishing. We would not drag it over the riffles; we would just stay on that side and walk below, if we wanted to fish. It was not possible to navigate even a rowboat across these riffles without you got out and pulled it.

Q. During the entire summer season, while the river was in its normal condition and not when there were any  
1526 freshets could you not navigate a rowboat over these riffles?

Objected to.

A. No. It was not possible.

I am talking about way back in 1848.

The water was turned in here first about 1871. I am talking about the condition before that time. When I was a boy I walked along the river,—went after cattle. We could see

the river from the house, see the whole of it, up as far as the lake and Brandon's bridge. There was a dam there, but below that there was not.

Q. Was it possible before 1871 to navigate the river with boats even in high stages of water?

Objected to.

A. Before 1871, as I said before, you could not navigate the river in high stages because the river would run through this brush and timber.

I do not recollect any fences being built across the Desplaines river when I was a boy. Everything laid there in common. Cattle ran backwards and forwards, and there was nothing fenced up. I put a fence across just a little above Brandon's bridge, and at the city limits of Joliet, that was on the land that I owned and leased. Mr. Sanger had one side and I had the other. I put that up some time in 1860, or 1866; I ain't certain now. It remained there until about fifteen years ago,—from 1865 to 1893, somewhere along twenty-eight years. I don't know as it is. I leased that on the other side. I sold that place to a syndicate down there, and did not pay any further attention to it. That was on either Section 20 or 21.

Q. Will you look at this map, Mr. Adler, and then tell us if you can, what section it was that that fence was on?

A. (Looking at the map) 21, that is right.

Q. Then it was Section 21, Township 35 North, Range 10 East of the Third Principal Meridian, in Will County in Joliet Township. Is that right?

A. Yes, sir. That fence was above Brandon's ford. I think it was about 10 or 15 rods above Brandon's bridge. There was a fence up next to the city limits, South street of Joliet. I built that, it might be in 1866 or 1867. I know I bought it in that neighborhood, and when I bought it, I fenced it. That fence remained there as long as the other. I built both of those fences at the time I bought the land. If I bought that land before 1865, I fenced it before that and if I bought it after, I fenced it after. Sometimes, when I did not forget it, I would go and take these fences up in the fall of the year; if I forgot it I would put them up in the spring, but took them down in the fall, so that the ice would not carry them away. I fenced that because I leased of Sanger that land on the other side, and it saved me the trouble of fencing all around it.

The distance between the upper fence and the lower fence, kit-a-corner across, was about 160 acres, I should judge. I don't know of any other fences down there across the river at any time. I saw fences above Joliet. I sould some cows to Sanger. I went there and bought some in pasture, and  
 1532 I saw fences across the river there. It was a little above the state prison, two miles, or a mile and a half above what is known as the Sanger property. I saw these fences there about 1865, along there. I don't know that I saw them after. Yes, I did. I went back and forth across the river to see cattle, and I would see fences there. I cannot recollect how many years.

I don't know of any fences across the river below Joliet except the two fences I put in there myself. I know of fences that ran into the river at right angles to the river. I  
 1533 built fences of that kind myself, on my own land. That was later; I cannot tell what time it was. I could not remember the years; some time after I bought the land. We generally built them extending into the water, so that the cattle could not go around. Other farmers and land owners had fences of that kind. I had a piece of land below there, about a mile, and I used to run the fence in quite a ways. There are other fences run in the river there. The river is deep there.

1534

*Cross-Examination.*

Those fences which I built across the river were built many years after the canal was in operation. I understand the Illinois and Michigan Canal was put in operation about 1848. Those fences, built down into the river, were built to keep the cattle from getting out where the water was too deep for them to go around. I built the fences out. Sometimes the water was four or five feet deep. I built them so that the cattle would not wade around.

At the fords I have spoken of before they let in the water from Chicago, in the summer time, the riffles sometimes  
 1535 were almost dry, and then where the water was standing it was deeper. At some seasons of some years there would be very little water running over the riffles, and at other seasons it would flood the whole country. Sometimes they forded it when it was three feet deep, and occasionally even deeper than that.

I don't think there was a bridge down near Brandon's Bridge where it is now, in the early days. The bottom of the river was stone and hard, so that you could haul a  
1536 load across. There was too much water there to ford in flood times,—there was in the spring of the year.

The water in the river when there was freshets would run off quick. It would go if it stopped raining. After an extremely hard rain, and if it did not rain for a day or two, it would go in two or three days. There were enough times when they could not ford the river, so that they built the bridge. When the river was big, it would come and run around this way (indicating), and this way (indicating). The rains would come right through the main stream. It ran through the timber half a mile.

1537 When the river was low it stayed within its natural banks, and when it was very high, it went out over the  
1538 bottom lands. There was not any bank for it to strike when it went out of its banks. It was pretty level all the way through. There is a little bank when the river is low, but not much. In the high water, the canal bank was one bank, and then the bluff on the other side was another.

There was a bank on both sides. This river is pretty  
1539 flat, and when the water is high it don't lag at any of the banks, but goes through the brush and everything. After it went on southwest across the bottoms it came into the lake, and then there was a bank on each side. When the river was high and ran across the bottoms, it went until it came to a bank of some size or other, and then it turned  
1540 the other way again across the river. That is true of all rivers. When the river ran over the bottoms that did not cause the old channel to be emptied, it was also full.

1541 In the old channel the thing to hinder a boat from going up and down when it was high was the riffles which were so strong it could not go up. I am not an expert on what a boat can do in water, more than to run a skiff. You could row across the river straight on one side, and probably go down to about one-half or one-fourth of a mile. You could not go up it when it was high. I don't think a sail boat could have gone up and down. It might, but I don't see as it could.

I have seen a steamboat on the Mississippi where the current was very rapid. I have seen some very rapid currents

on the Mississippi. Sometimes the boats would run against a log or brush, at other times they would go right on where they wanted to. This current here was a little stiffer than in

the Mississippi, I think, a little more rapid. I went 1543 from St. Louis to Leavenworth. I think it was on the

Mississippi. No, it was on the Missouri. It was in the Missouri that I saw the rapids. I don't know as the current there was stronger or not stronger. I never saw a boat try to go up the Desplaines on these rapids. In these times, of this great current, the river was spread out probably half a mile wide, and probably it was five or six feet deep,—somewhere around there, on the riffles. I don't know as it was more than four. I never was on it when it was high to measure it. This water that I referred to being pumped into the Illinois and Michigan canal was the water pumped in at the

Stock Yards, Chicago. It ran into the river here at the 1545 upper basin,—that is, right here by the State's Prison. Some of it ran in at Lockport.

I think it is according to how heavy the trade is, how deep water is necessary for commercial traffic. I think if 1546 you have 8 or 10 feet, it would run a good skiff across it. I should think that the water ought to be not less than 10 feet in the river in order that it may be navigated for commercial purposes. Probably it can run at 8 feet, or 7 feet. I am not positive on that,—only just what I see.

I think my fences built across the river were 15 or 1547 20 rods above Brandon's Bridge; that is the lower one, 1550 the one further down the river. (The witness was here shown a map, previously referred to, and indicated the lines of his land thereon.)

The WITNESS (continuing):—Instead of its being 10 or 15 rods, I think it was 80 rods. I see now, between this road and that section line is Davidson's. I didn't own the land shown on the map there, marked "Pioneer Stone Company's land," but the fences ran right along up to the canal. It was undoubtedly in Section 21.

1551 Q. Then undoubtedly it (referring to the land fenced by witness) was in Section 21.

A. Yes, if I was studying on it and had been looking at it, I could tell better than I could at random when I don't know anything about it.

Q. Do you know as a matter of fact whether it was in Section 20 or 21?

A. Well, it was in Section 20.

COUNSEL FOR DEFENDANT. 21.

A. 21. It was in Section 21.

*Re-direct Examination.*

1552 It is a fact that the lower fence that I built on my land was in Section 21.

1553 Q. After I called your attention to the fact that it was Section 21 a few minutes ago, you looked at the map and said yes, it was Section 21.

Objection by counsel for complainant on the ground that the question was telling the witness what to say.

A. Yes.

1554 WILLIAM S. BURT, a witness for defendant, testified as follows:

*Direct Examination.*

My name is William S. Burt. I live at No. 708 Prairie avenue, Joliet. It will be eight years in March since I moved in here this last time. I lived  $2\frac{1}{2}$  miles northwest of Lockport before I came to Joliet. That was in Will County. I moved there in 1865. I lived there continuously from 1865 up to eight years ago about 35 years. Before '65 I lived in 1555 different places around Lockport and Joliet. I was born in the State of New York in 1830. I came to Chicago the 1st of October, 1850, and came to Will County the next day, and have lived here continuously since 1850, except for a few months' time.

I farmed quite a little bit when we first came to the country. I was boatman on the canal for five years. I was living in town up in the '60s, keeping a saloon here in Joliet. When I left town in '65, I went out on a farm. Before that time I had a farm for three or four years, east of Lock- 1556 port, away back in 1858 or '59. I managed the farm all the years I lived there. Before I came here in 1850, I was on the canal, on the Erie Canal in the State of New York. I was employed there about eight year. My duties were everything from driver up. On the Illinois & Michigan Canal, in the first place I was on the packet boats one year

and a share of another year. After that I was running a boat from Lockport for a Mr. Martin a couple of years, and then a boat from Lemont, a stoneboat. I am familiar with the kind of boats they have used on the Illinois & Michigan Canal. The boats were I think, about 105 feet long, and they must have been about 15 to 18 feet wide. They were allowed to load them down to 3 feet and a half. Of course they could load deeper than that, but that was as deep as they could be allowed, on account of the depth of the water in the canal in places. The water in the canal, I presume, was something like 4 feet deep.

COUNSEL FOR COMPLAINANT. I want to object to each and every question concerning the navigation and depth of water in the Illinois & Michigan Canal.

Q. Please state where the shallow places were in the canal between Joliet and Chicago.

1558 A. There was a place a mile or such a matter from Willow Springs. There was a little creek in there of shallow water, that was the only place I knew between here and Chicago.

I have been familiar with the Desplaines river since 1850, going fishing sometimes, something of that kind, I never was on it on the boats, rides or anything of that kind.

From here to Lemont the Desplaines river runs pretty near the canal. Below here, after you get below Brandon Bridge, it is not so close, nor above Lemont. I never knew that below Channahon the canal turned in near the river and

1559 run along close by the river up a ways. I never noticed it. I was on the Desplaines river fishing. I don't know the first time I went fishing. It is pretty hard to tell. I never was much of a fisherman, just go occasionally. But I don't think when we first came to the river I went fishing for four or five years. When I first came to the river, it was customary to cross the river at Lockport Bridge, a wooden low bridge, and at Romeo, I won't say whether there was any bridge or not. I did not cross any place only at Lockport.

Below Romeo I just walked across. There was no bridge at Romeo near 1850. There was no bridge till you 1560 got to Lockport. I don't know anything about how the farmers hauled their loads across the river below Joliet. In 1850 there was a dam at Lockport that stretched clear across the river. It was known as Daggett's Mill. There was a dam here at Jackson street, another at Jeffer-



son street, another one down here, I guess they call it Adam's dam. There were three dams at Joliet that stretched clear across the river. This dam I speak of as the Adam's dam, is sometimes referred to as the Haven's dam, and at 1561 other times as the Malcolm dam. That was situated somewhere near McDonough street. The one at Jackson street was substantially at the place where the Economy Light & Power Company dam now is, known as Dam No. 1. I do not know of any other dams that were in the river at that time. I had no opportunity to observe the river below Joliet. I don't know anything about the dam at Treat's Island. I never was at Treat's Island but once. I didn't notice any dam then. I do not know whether there ever 1562 was a dam at the place called Dresden Heights. These three dams at Joliet were so constructed that boats could not go out through them. There was a lock for the canal boats on the side. There were no locks in the dam at Lockport.

Q. Now, from your familiarity with the river, will you please state what was the normal condition of the river with respect to depth of water during the summer season, say beginning about the first of May, and ending about the first of October?

COUNSEL FOR COMPLAINANT. I object to his question, because the witness has not qualified himself to answer. What he has given of his knowledge of the river does not qualify him to answer these questions.

A. Why, the depth of the river in some places varies very much.

In some places there wasn't more than a foot or so of 1563 water. Of course there were riffles and there were places with water 2 or 3 feet deep in deep places; very many places where you could walk right across by stepping on the stones without getting your shoes in the water.

Q. Was that the general and usual condition throughout the entire summer season of every year? I mean by usual conditions, normal conditions, when there was no freshet or flood?

Objected to as leading and suggestive.

A. Yes, sir.

Q. State whether or not there was a good many shallow places in the river, or rapids or riffles.

Objected to as leading and suggestive.

A. Yes, sir.

Take it from Lockport, between Lockport and Romeo, there were more places you could walk across the river than there was where there was a depth of water, so you could not. This side of Lockport, there seemed to be a little more water. Of course they got some water from the canal there through the mill race. That was after 1871. Before 1871 I 1564 wasn't so much acquainted with the river below Lockport. Some of these rapids would be 15 or 20 rods long, some of them not so long. Some of them would be only just in small places a few rods. I crossed over the river at this point a good many times.

Q. Was it possible to navigate boats up through these rapids or riffles without getting out there and bringing the boats with you?

Objected to.

A. No, sir.

Q. Was it possible to navigate even a low boat or a skiff up through those rapids in the ordinary and normal condition during the summer season?

Objected to.

A. No, sir.

I never knew of any boat or boats used upon the Desplaines river at any time for purposes of commerce; that is, transportation of freight or passengers.

1565 Q. If there had been any such boat or boats used, would you have known it?

Objected to.

A. It seems as though I would.

Q. Did you ever know or hear of any boat or boats of any kind used for commercial purposes, being on the river below Joliet?

Objected to.

A. No, sir.

It was customary at the time I first came to this country for farmers to take their produce to the Chicago market by the canal. I did not even hear or know of any farmers in Will County taking their produce to the Chicago market by way of boat on the Desplaines river. I never heard of 1556 any merchandise being brought up the Desplaines river from the south by boat.

Q. Did the packet boats that plied upon the canal at the

time you were employed there, carry passengers as well as freight?

Objected to.

A. Mostly passengers.

They had sleeping and eating accommodations. They used the regular cabin for dining room at meal times. At other times they used the regular cabin for lounging rooms. The boats would carry better than 100 passengers. These 1567 passengers were going to La Salle to take the steamers from there. To make the trip from Chicago to La Salle by way of the canal boat, would take about 24 hours by a passenger boat; by a freight boat, about four days.

Questions pertaining to canal and its boats objected to; motion to exclude answers thereto.

I have known in late years of fences being constructed across the Desplaines river, wire fences, something of that kind. I don't remember any fences across the river in 1850. I think the first fences that I could ever be positive about, is since '65. I lived not far from the river, and I had occasion to go to the river quite a good deal. There were fences across the river then. That was two miles and a half north-west of Lockport. There were two fences right here. There was a lane that ran down from the main road, and we 1568 used to have to put our cattle there to water a great deal in the summer, because we had no water in the summer. I know there was a fence each side of that lane there at the river. It was a wire fence that stretched clear across the river.

It remained there for 33 years that I was there, except when the high water or something of that kind would carry it away. The fence was rebuilt from time to time during that period. One side of the fence was kept up by a man named Whitman. His land was on the north side of this lane, and I think the other side was kept by by Fitzpatrick's. There was another fence about a mile above the Lockport road, 1569 running between Mr. Allen's and Fitzpatrick's. That was above Lockport about half a mile. There was just one fence there. I noticed it soon after '65. It is there yet so far as I know. I saw it frequently up to five years ago. I don't think of any other fences. I think I could locate the number of the section upon which the first two fences 1570 were constructed by looking at the map.

Mr. MUNROE. What township is it in?

COUNSEL FOR COMPLAINANT. I object first to the question, because there is no proof that the map is in any sense correct, and second I object to counsel or to Munroe furnishing the map and the page with the section indicated to the witness.

Mr. MUNROE. What township is it in?

A. I think 36 Lockport.

(Whereupon the witness examined the map.)

Mr. MUNROE. Here is Romeo up here.

A. I think here is one fence I speak of between Allen's and Fitzpatrick's; I think the other fence is here, but it was not up there next to Alexanders'. It seemed as though it must have been here some place in Section 15 according to that. It must have been Section 15, Township 36. It 1571 must have been on the section line. My place is on the north section line of Section 15. The other fence was two rods below it. The third fence was between Sections 15 and 22.

*Cross-Examination.*

1572 One of the fences would be on the north side of Section 15; another one was about 2 rods south of that in Section 15, and the third would be on the south side of Section 15, between it and the section line south of it, which 1573 would be 22. There were two strands of wire. I have not been on the river so very much. For the first five years I did not go fishing at all, and have gone very few times after that. I used to have to drive my stock to the river to water pretty much when I was on the farm in the summer time. That constitutes the fishing that I was speaking of, and crossing the river and driving my cattle to the river constitutes the sum and total of my time on the river. The motive power of the packets that run on the canal was horses. The packets go about 5 miles an hour. The horses went a slow trot. While I think there was a limit of speed; that is, they could not run so fast as to throw the water over the banks to endanger them. From Lockport to Romeo, it is 3 miles, to Lemont, 8 miles. I said I was able to cross 1575 the river there stepping from stone to stone. I refer to the low water times. There were times when the water wouldn't be 6 inches deep. That would be quite a dry ordinary time. In ordinary stages of water, it would be a foot or a foot and a half, and those were the shallow

places in the river, and in high water it would go up to 5 or 6 feet.

In high water between Romeo and Lemont, the river would be a mile wide nearly;  $\frac{3}{4}$  of a mile anyway sometimes. It might be 4 or 5 feet deep or 6 in the channel. The channel between Lockport and Romeo would be 30 or 40 feet 1576 wide. I have a good idea of what 30 or 40 feet would be. Of course where those places were, there likely would be islands. The channel was divided; part of it was on one side and part of it on the other. There were mostly flat stones in the river, a kind of limestone. They varied in size, sometimes as much as a man would want to lift. Sometimes they wouldn't be any bigger than your hand. You could pass sometimes over the stones without getting your feet wet at all.

1577 DAVID LAYTON, a witness for defendant, testified as follows:

*Direct Examination.*

I live in West Linden avenue 112, in Joliet, Illinois. I have lived in the city proper for twenty-five years. Before that I lived up here in the Town of New Lennox. That is the last place I lived on farms, but I was raised out here about two miles from town. I was not born in Will County. I was nine years old when I came to Will County. I was born in 1828. When I first came to Will County, I lived out 1578 here about two miles southeast of Joliet on a farm.

My father managed the farm; we did not live there many years. My father did not own any land at that time, and we lived right around in the neighborhood. After that we lived on Deacon Scott's farm near Joliet about 3 miles; lived there 2 years.

After that we lived down here at Joliet Mounds in Will County. I have not lived in Will County continuously 1579 since I first came here. I was gone about 10 years—from 1869 to 1880, when I moved to western Missouri. With that exception I have lived here continuously.

Part of the time I kept a grocery store in Joliet. Well, I ought to be familiar with the Desplaines river. I have travelled up and down it a good deal fishing and so on. Between '37 and '48 I was familiar with it. During those years I fre-

quently was fishing in it, half a dozen times or so from the head of Lake Joliet up as far as Joliet. Sometimes I 1580 was up as far as Romeo. In 1837 I think there was a dam at the Haven saw mill. That was just below the Rock Island bridge. The Haven mill was between McDonough street bridge and the Rock Island bridge. That dam was sometimes known as the Malcolm dam, and sometimes the Adams dam. There was no way in which boats could go up and down from that dam. I cannot tell you when I first saw it, probably 1840, the first that I remember seeing it. There was a dam at the Jefferson street bridge here in Joliet. In '48 I think the Canal Commissioners built the dam.

McKay had a small dam there; that is, in '37, there was 1581 a small dam called the McKay dam, near the place which is now known as the Jefferson street dam. That dam which was built by the Canal Commissioners is the dam known as Dam No. 2, and is not in existence now. There is no dam there. This state dam was built to make a basin, so that 1582 boats could come from the canal down there along the warehouse. The McKay dam was taken out of the river about 1842 or '43. Then afterwards the state built a dam near the same site across the river. I cannot tell the year that was taken out. It was when the Drainage Canal started operations.

I cannot think of any other dam in the river at the time I first come to Joliet. The dam at Hyde's mill was built 1583 afterwards, I think. That is just about above the Jackson street bridge, about the place where the dam of the Economy Light & Power Company now is. I don't remember the dam known as the Norman dam at Lockport. I know there was a dam, but I cannot say what kind it was there. There was an old mill just west of Lockport, but they had a temporary dam. It was not across the river either really. I am familiar with the river below Joliet. I think there was a dam at Treat's Island. There was not a mill there while I knew it. I know that the dam was there, but the mill was gone.

There was a dam this way down we used to call the Aqueduct, there was a dam there that was close to Dresden 1584 Heights. That is sometimes referred to as Beardstown. I saw that dam when I first came here. There was not a mill there at the time I was there. The mill had

gone. It was not possible when I saw the dam for boats to go up through it and go down the river to it.

I know there were rapids or riffles in the river. I cannot tell where all of them were exactly now. There was one 1585 below where they built the tinplate mill at the mouth of Hickory Creek. I walked across that many times. That is near the south limits of Joliet. I could not tell you the extent of those rapids in length. I have carried a boat round them several times, but I don't know the distance.

Q. Was it impossible to get the skiff through them?

A. Not any time it wasn't.

There was another rapid at Brandon's bridge at the head of Lake Joliet. The extent of these rapids in length was, I suppose, 20 rods.

Q. Was it possible in ordinary seasons to navigate a boat over those rapids?

A. Oh, no.

Q. What other rapids do you recollect being in the river?

A. Well, I cannot tell you exactly how many there were several.

Q. Do you remember of observing the rapids at Treat's Island?

A. Yes, sir.

1586 I have had occasion to cross there. It was not possible to navigate a boat over those rapids. That was 15 to 20 rods long. I don't know the exact extent of the rapids at Smith's bridge. I remember observing the rapids down at Beardstown. I don't know how long they were, but I know they were very rapid. They ran pretty rapid across there when the water was up. It was not possible to navigate a boat over those rapids, either up or down. I remember that there were rapids above Joliet, but I cannot locate them just now just where they were, because I fished there years ago clear up as far as Romeo in the deep places. 1587 I had occasion in my boyhood days to cross the river a great many times. The customary crossing was down below the mouth of the Hickory Creek, and another one down at what we call Brandon's bridge. There was regular wagon roads crossing the stream at this point. I don't remember that there was any wagon road right in the City of Joliet crossing the stream.

Q. Don't you remember that there was a ford in the City of Joliet?

Objected to as leading and suggestive.



A. I don't. There wasn't much sediment up there in them days.

1588 In the flood seasons there was considerable water in the Desplaines river. As to the normal condition of the river with respect to depth of water during the entire summer season, beginning with May 1st and ending we will say, October 1st, excepting as I say the pool places, there was sometimes considerable water, but in these riffles and shallow places, there wasn't any water at all hardly, just very little, excepting when there were freshets. These freshets would last 2 or 3 days, but the water would soon run down, because it was very rapid. It was not possible to navigate a rowboat up and down the river over those various rapids and riffles during the ordinary and normal state of the water at any time, excepting when there were freshets. It was not possible because the water ran so rapid.

1589 There were a good many rocks and boulders in the river at the point where these rapids were. As I say, I have walked across and not wet my feet at those places just below the mouth of Hickory Creek in summer time. Sometimes there was not over two inches of water in some of these rapids, and sometimes it would be more. It did not range much deeper than that.

I have never seen any boats carrying freight or passengers, or used for commercial purposes navigating up and  
1590 down the Desplaines river, at any place, at any time. I never heard of any being navigated. I never heard of any merchandise or produce being transported up from the Illinois river. They used to haul merchandise by team from Ottawa to Joliet. It could not come up any further than Ottawa before the canal, and we used to go  
1591 down there and bring it up by teams. Merchandise and produce between Chicago and Joliet was brought always by team. I hauled wheat up to Chicago when I was fifteen years old, in 1843. I hauled grain three or four times after that. I never brought back anything.

Between 1837 and 1848, it was customary for farmers in this vicinity to get their grain or produce to the Chicago market by team. The road was not very good,—in some  
1592 places, that is sure. It was swampy. My father came to Joliet in 1837 by team from Indiana.

I saw at one time there was a wire fence across the Desplaines river below the mouth of Hickory creek. That was

about 1852, or 1853; I could not tell exactly the date. I  
1593 saw it there one summer,—that is all. I was fishing down there. I don't know how long it stayed there. I never saw any other fences across the river. When I went fishing we put in our boat at the head of Lake Joliet generally, and we did not use the boat without it was to spear in the night. We kept the boat at home. We hauled the boat by team and put it in the stream at the nearest point to our home. When we came to the rapids or riffles we carted it around. We usually fished near here from the head of the lake. In fishing from the head of Lake Joliet to the City of Joliet we would have to carry out boat around the rapids three or four times.

1594 In some places there might be water, but it would be so swift that we could not row it up. In other places there would not be water enough. We usually fished about the middle of May. The water then would be a little higher than it would be in the later summer months.

Q. So, as I understand you, the only place where you could navigate your boat properly was in the pools or ponds that occurred from place to place in the river.

A. Yes, sir.

I remember when the Kankakee feeder was being constructed, but I had not been down there yet at the time  
1595 it was done. My home where I live, just south of Joliet was about a mile. We lived less than that, but the last place we lived before my father died was maybe one and a half miles.

#### *Cross-Examination.*

The roads from Joliet to Chicago were common prairie dirt roads, and in that early day people had not worked them much, so that it was just a road or path, or trail across the prairie; and in the condition that the prairie roads in this region were at that time,—sometimes good, sometimes bad.

1596 We never teamed any in the muddy times,—in the spring time. In the summer times the roads were pretty good. At the place where I spoke of crossing the river by stepping from stone to stone, the water might have been three or four inches,—maybe more. It would just run between the stones. It was not a foot. When I did that, I cannot recall the years; it was before 1848.

1597 The fences that I spoke of was in 1852 or 1853, after the canal was built and in operation. We crossed that

place below Hickory creek, where the water was three or four inches deep from spring to fall. We lived below there. That was our regular road. The teams went there in the summer months. I don't remember the condition in 1876.

I was not here at that time. When the river was at high flood, it spread over considerable land down here. I could not tell you how wide it would be,—probably 80 rods, that would be one-fourth of a mile. I could not tell you how deep it was, because I never measured it. It might be four or five feet. I did not measure it at high time, or low.

1599 The ford at Hickory creek was a mile below the dam,—a mile down the river. There were no dams, except what you call Malcolm and Haven dams.

1600 Q. You said in your direct examination, did you not, and it is true also, is it not, that sometimes in places where you took your boat out and carried it around the rapids was because the current was so strong that you could not handle the boat in it?

A. I said they could not handle the boat.

Q. In the current.

A. When the water was high. If the boulders had been out of the way in the shallow places, you could not have taken your boat up in dry times. At such times the river might have been 10 rods, or 15 rods wide. I could not tell you exactly, because I never measured it.

1601 I don't know for certain whether the fence I spoke about went clear across the river or not. I suppose it was put in to turn stock in it. It was the only fence I remember about.

1602 JOHN P. KING, a witness for defendant, testified as follows:

*Direct Examination.*

I have lived in Joliet; I have lived here 41 or 42 years. I have lived in Will County about 73 years, with the exception of 12 years, when I was in California. I came here in 1834. I was born in 1832. My parents came to Will County by means of a wagon and oxen from Indiana.

1603 Up to the time I was about 23 years old I was on a farm, farming, and after that I went to California and stayed twelve years, and when I came back, I went into the

lumber business, and have been in the lumber business ever since, in and about the City of Joliet. I was 16 years old in 1848.

The method before 1848 of transporting grain and produce and merchandise between Chicago and Joliet was by team only, till after they got the canal going. I didn't know or hear of any grain being transported between Chicago and Joliet by boat on the Desplaines river. Before 1848, I didn't know or hear of any freight or merchandise being transported up and down the Desplaines river below Joliet by boat on the river.

In the days before 1848 there was a good deal of merchandise brought up to La Salle on the boat and from there hauled by teams. I never knew of any boat being navigated on the Illinois river up and down for commercial purposes before 1848 or after. I never heard of any such boat being operated or navigated on the Desplaines river at any time. I am familiar with the river. I had occasion to go on it and across it before 1848. The method before 1848, of crossing the river with teams, hauling loads was to cross the riffles. There was regular wagon roads crossing the river in those days. There was one down here at Brandon's bridge. There was one at Treat's Island. They crossed the island and forded the two streams. Part of the river goes down on one side and part on the other. There was a road across both of those channels. The farmers and everybody else who wanted to go across the river had to go that way. There was no other way. They crossed there at any time of the year except in high water. There was no other ford at Smith's bridge. There is a regular wagon road across there. I don't remember any other fords except here in Joliet before they got bridges. For a short time they forded the river in Joliet, but it was not a very good ford. They built a regular log bridge,—a cheap concern. There was a ford at Lockport that was commonly used by the farmers in hauling loads.

I was on the Desplaines river in a boat down in Lake Joliet. I have been along the Desplaines river above and below Joliet, but not in a boat. When the water was high on the river, it was generally too swift and dangerous for a boat, and if it was not, it was too low,—you could not get along. There were a few boats used on the river before 1848 for fishing and canoeing.

Q. You are familiar, are you Mr. King, with the river, generally speaking, from Lockport down to its mouth.

A. Well, yes. I have been along it all the ways pretty much. During the summer seasons it was sometimes pretty low, and on the riffles if you would pick your steps you 1608 could cross on the stones. You could almost cross most of the time, and sometimes you could cross it dry-footed. The first of the rapids was this side of Brandon's bridge, below the Jefferson street bridge.

The rapids don't start much until after you get pretty near out of the city limits of Joliet. I would not undertake to say exactly how long the rapids are at Treat's Island, but I think they are a mile. The river down near the mouth is pretty rapid,—that is near Beardstown, or what is known as Dresden Heights. Those rapids must run up one-half mile.

There is a good swift fall from the head of Treat's Is- 1609 land down to the mouth. I could not tell you how swift the current is there,—is pretty swift. A skiff could not be navigated below Treat's Island. I have seen the river at flood stages when it would be very dangerous to cross it. It would not have been possible in flood time to navigate a skiff or row boat in that part of the river above Lake Joliet, near and above Adams dam. I saw that part of the river frequently before and after 1848. A skiff or rowboat could not be navigated up that part of the river during flood sea- 1610 son, because the water is too swift. If you wanted to take the chance of getting drowned, you could navigate a skiff down the river between those points during flood season; I would not want to do it.

I was not so familiar with the river up above Joliet. Still, it had a good current in there when there was high water. I have seen the river when it was not possible to navigate a skiff; you would get out and pull it along between the rocks.

Q. Well, I am taking the river at its usual stage, Mr. King, when there was no freshet on. Would it be possible at any time during the summer season to have navigated a boat?

A. You mean all the time, when there was no freshet on?

Q. Yes.

A. Well, they might possibly go down some of the time, but not all the time.

1611 You might possibly float it down most of the time, but you could not get up very well. It was not possible during any time of the summer season to navigate a boat up and down the river for commercial purposes.

I heard them say there was a dam at Beardstown. I don't remember personally.

Before the canal was in operation in 1848, there was a dam here at Joliet. There was one at Malcolm's mill. The Havens put in a dam there, they had a sawmill. That is called the Malcolm dam, sometimes the Haven dam and sometimes the Adams dam. Before 1848 there was a dam right here on the north side of Jefferson street. That was known as the McKee dam. There was a dam where Jackson street now is in Joliet. I don't know whether that was prior to 1848, or not. I don't remember the existence of any dam in Joliet prior to 1848. I think there was a grist mill, below Lockport they had a dam there.

I have seen fences in the river to let the stock drink. I think right below town there is a fence across the river between here and Brandon's bridge. The fence was clear across the river. That when when I was a boy. I don't know how long it stayed there. I saw it often. It might have been 1614 a good many years. I am not positive of that. The other fences that I remember were fences which the farmers built down into the river for a short distance, so as to prevent their cattle from wading around.

If the river had ever been navigated by boats for commercial purposes, I think I would have known of it. There is no navigation in the river now for commercial purposes.

Before 1848 I did have occasion to go to Chicago with grain. I hauled it by team. I never was up there very much myself. I might when I was just big enough to drive an extra team with a load, when my father would go. He used to 1615 haul his grain there and get supplies from there. The other farmers in Will County got their grain there the same way. That was the principal market for farmers in this vicinity. I did not ever hear of any grain being taken up to Chicago on the Desplaines river before 1848. There was a stage line running which brought passengers from Chicago to Joliet. They had a station here and it ran down as far as Peru or La Salle. It ran only about three times a week. The name of that stage line was Frink and Walker.

I didn't ever hear of anybody coming down from Chicago to Joliet, and down the river from Joliet by boat.

I don't think anybody teamed it back and forth regularly carrying produce and merchandise for the farmers.

*Cross-Examination.*

When I spoke of crossing the river from May to October, I meant from the first of April up until the fall. The 1617 spring floods come in always along the last of March.

The river would be at its lowest stage in May, June, July, August, September and October. The river is not generally pretty high in May. I have seen it in high water

1618 when you could not cross the river or ford it. It would be just as true to say that you can ford the river in low water, as to say you cannot ford it in high water. If it was too high, you could not ford the river. They used to ford the river when there were two, three or even three and a half feet of water at the fords.

In order for a river to be navigated for commercial purposes carrying freight and things, the water necessary would depend upon how heavy freighting you wanted to be done. If it was light you would not require much water.

To conduct a commercial traffic on the river with boats, in order to make it profitable you ought to have a depth of three or four feet of water.

Q. And when you have spoken about it not being possible to have commercial navigation on this river for want of 1619 water you meant because there were not at least three or four feet of water in the river?

A. If it was rapids it would need a great deal more than three or four feet, and then it would not make navigation.

Q. It would depend upon the character of the rapids?

A. Yes, sir.

Q. The other things that you had in mind were those rapids, and some boulders and stones in the river, was it not; the other things you meant would interfere with commercial traffic?

A. Yes, sir.

*Re-direct Examination.*

When I could cross the river at the riffles or rapids without getting my feet very wet was perhaps two or three months in the driest part of the season.

1620 Probably five or six months of the year the river would be at such a stage of water that it would be impossible to navigate rowboats up and down over the riffles without dragging the boats.



*Re-cross Examination.*

That five or six months includes the time when there was not enough water on the one hand; and then when there was too much, and the current too great. During five or six months of the year the water was not sufficient for that kind of navigation. The other six months would include the winter 1621 when the water would be very low, too. There would not be more than two or three months in the whole year when they could get over the rapids, and then they would have to take chances. What I mean—the water would be low at least nine months out of the year. Ordinarily the water over the rapids on those low places would be a foot or a foot and a half deep; and in some places three or four inches.

1622 ADAM COMSTOCK, a witness for defendant, testified as follows:

*Direct Examination.*

My full name is Adam Comstock. I reside in Joliet. My parents came here in 1836. In 1837 they moved out onto a farm about five miles out, bordering on Lake Joliet. In 1841 they came back to Joliet and that has been my home since. I was born in 1827. My business has been surveying and railroad engineering; have been in that business since about 1851. I commenced on the survey of the Rock Island Road here. Afterwards I have been county surveyor and city engineer and city surveyor, and have been engaged on railroads in Wisconsin, Illinois, Kentucky, Mississippi, Arkansas, Mis-  
1623 souri, Kansas and Colorado. When my parents first came to Joliet they came from Detroit with a team.

I remember the days before 1848 there was a dam here we called the McKee dam. I recollect our fording the river just a little ways below the dam. From 1841 to 1848 I was very familiar with the Desplaines, used to go hunting down along the river and wade across it at different places. From here down to its mouth I was familiar with it, not so much above Joliet. Before 1848 I was not in business, only hunting took me along the river. I do not recollect going on the river in a boat prior to 1848, hunting or fishing. As to the depth  
1624 of the water in the river between '41 and '48, I could wade across it without going over my boots. That

would be in the latter part of the season, from the time ducks came along in September up to the time the river froze. May first the river would be high probably, the spring freshet. It would last a long time, June, maybe, that the water would be rather above the normal. Then from June to November the usual normal condition with respect to the depth of water was about as I said. The water might be a little deeper along in the first part of the summer, would not get its lowest maybe till along after July. During the summer season the water over the rapids and riffles would be 1625 less than a foot and a half. I am familiar with the rapids and riffles in the river below Joliet. The first riffles were along about the islands below town, just below South street, before you get down to the head of the lake. Some part of the way it was more shallow and rapid than in other places. Practically the entire distance down to the head of Lake Joliet, about a mile, I would call rapids or riffles. West of the second island there was a slight pool for maybe seven or eight hundred feet, and then at the foot of a second island there was a sharp rapid there and then down where the first bridge is there was quite a sharp rapid. The last place I mention is where Brandon's bridge now is; that is included within the mile of rapids that I speak of. Below these rapids was a rapid at the head of Treat's Island and one at the foot, and one at the mouth of the Du Page. That at the head of Treat's Island was not, I should judge, more than a thousand feet long. Then there was a pool along 1626 the middle of the island and at the lower end was a rapid perhaps 600 feet long. Below Treat's Island, at the mouth of the Du Page, there was quite a sharp rapid, not very long, and then down at the mouth of the river there were rapids at the place sometimes called Dresden Heights and sometimes called Beardstown. I could not tell the extent of those rapids, about a mile, maybe. I could not tell the velocity over these various rapids below Joliet. Personally I know that from South street through to the head of 1627 the lake there was a 10-foot fall in about a little over a mile. I do not know what the fall is from below the head of Lake Joliet to the mouth. Personally I do not know anything about the fall of the river between Lake Joliet and its mouth.

Q. Do you know from your personal observation that there

was a considerable fall of the river from Lake Joliet to the mouth?

Objected to as leading.

A. Oh, yes; these rapids indicate that.

1628 The WITNESS. The normal and usual condition of the river upon these various rapids, as to depth of water, was that it would carry from something like a foot and a half to maybe six or eight feet. The foot and a half stage would prevail three-quarters of the year, probably; the remaining quarter the river would be flooded. When the water was a foot to a foot and a half over these rapids, they would worry skiffs along over them by pulling them over the rapids going down. They would have a hard matter getting up. They might worry them along and they might have to push them along, or get out and pull them along. A skiff that could go into shallow water, they would probably row along  
1629 right close to the edge of shore and keep within the current, and they would take their chances of going down in the high water. They would have to be pretty skillfully handled or they would be apt to capsize. A skiff I should say could come along up the river in high water and keep close to shore. I do not know of anybody rowing a skiff up the river from its mouth to Joliet during the high water season. I did not hear of anybody having done it or having taken a skiff down to the mouth during the high water season. There were not many skiffs or rowboats in the river in 1848. There were not any boats used for other purposes than hunting and fishing and pleasure boats. I never knew of any boats used in the Desplaines river for purposes of commerce such as carrying freight or passengers. I never heard of any such boats before 1848 or afterwards.

Q. If there had been any such boats in existence here you would have known it?

1630 Objection by counsel for complainant.

A. Most assuredly I would. It would have been a matter of general interest to people if there was any commercial navigation on the river. I do not remember that in the early days of my experience I talked with old residents with reference to the previous condition of the river. I was acquainted with many old settlers, but do not remember ever discussing that subject with them. In my boyhood days there were bridges across the river, a couple of bridges built before 1840. I do not remember about them. That was when

we were living on the farm. After that, there was a bridge built across at the little island just below Jefferson street. The usual method of crossing the river in those days, prior to 1848, was fording or using these bridges. There were regular wagon roads across at the fording places. It was customary for the farmers to haul loads across. The canal 1631 was built along here about 1840. That shut off everything except where the bridges were. There was only one bridge then, the one at the little island just below Jefferson street. There was a bridge across the canal right where the present bridge is. I do not remember about crossing the river previous to 1841. I do not remember crossing previous to 1848. There was a ford down at the head of the lake and there was a ford across Treat's Island, another just below Treat's Island, and one down not far below the county line where the old mill stood. I have crossed at all these fords. During the summer time at these fords the water would be a foot and a half or less.

Q. Have you ever crossed the river at any of these rapids, when you would not get your feet wet?

Objected to.

A. At Treat's Island and at the islands below town and at the head of the lake I have waded across without 1632 getting my feet wet. There was a ford just below that we call Brandon's bridge, right at the head of the lake, that used to be used before there was ever a bridge built. I remember there was a dam in the river down near Beardstown, about a mile this way. I remember the old mill; I have been down there when the old mill was standing, but I haven't any recollection whether the dam was there then or not, or whether it had gone out. I saw a mill there that had been operated by means of water power. The mill and surroundings were in such condition that I knew a dam had been there. I think it must have been about 1847 or '48 that I first saw that. I haven't any recollection of the dam. My impression is that the ends of the dam showed where the dam had been.

I was never informed when the dam was built. I have 1633 seen the abutments and ends of the dam.

Q. And you know that there must have been a dam there on account of the mill?

Objection by counsel for complainant, on the ground that the question is leading.

A. Yes, sir; on account of the mill there must have been a dam.

The WITNESS There was a dam across one branch of the river at Treat's Island, then there was the Haven dam in town, and dam No. 2 and No. 1, the state dams. There was a dam at Lockport previous to 1848. I have seen the remains of an old mill near where the penitentiary now is, but it was not in operation. I do not remember any particulars about the dam.

Q. As to those dams that you do remember, those three dams in Joliet and the dam at Lockport, these were constructed clear across the river?

Objected to.

A. Yes.

It was not possible for boats to go up and down through those dams. There was a lock here at Dam No. 1 after 1834 that was built; that was not a lock into the canal, which crossed the river here. The canal and the river were together then. The canal and the river were the same above the dam and the canal and the river were together below the dam. That was down to Dam No. 2. There was no chance to get through No. 2 near the Haven dam. The water above No. 2 was turned into the canal. Before the canal commenced to operate in 1848 farmers got their produce to the Chicago market with teams. People traveling down this way came either by stage or their own teams. I do not know that considerable merchandise in those days was brought from 1835 points on the Illinois river up to Joliet. This stage line from Chicago must have gone down to La Salle and there was a line to Springfield and St. Louis. It would not have been possible to operate boats for commercial purposes, carrying freight and merchandise or passengers up the river through these various rapids that I have mentioned, even if the dams were not there. They say jokingly about these little sternwheel boats that they can run up on a heavy dew, but they could not one of them run up on these rapids. Produce was brought from away down beyond this, wheat, I think. I have seen teams come along here that were said to have come from away down near Bloomington, going to Chicago. I never heard it claimed prior to 1848 that the Desplaines river was navigable in fact. I never knew of any commerce being carried on prior to 1848 over the Desplaines river by boat, and I haven't known any since. The dam sometimes called the Adam dam, sometimes called the Haven

dam and sometimes called the Malcolm dam, was constructed while we were on the farm, between 1837 and 1841. I do not know when the McKee dam was constructed; it was there when we came to town in 1836. I do not remember when that dam was taken out of the river and Dam No. 2 was constructed by the state. Let's see, the state failed sometime along in the '40s and the work was not finished. The canal banks were built through here in '41 when we came back to town. I know the banks were finished and the dams, some of the masonry was not done until later on, 1845, '6 and '7. The dam was gone when we came back from the farm in 1841. I do not remember when the Kankakee feeder across the river near its mouth was being constructed. I do not know where they got stone to build the abutments for that feeder; do not know where they got the stone from that was used to build the Aux Sable locks; I haven't noticed the stone down there particularly. I never knew of any stone being transported down the river by boat for the construction of that feeder; there could not have been without my knowing it. The quarries that were used in building those locks and dams were situated above here in what they called North Joliet, above Dam No. 1, and if they had ever quarried those stone up at those quarries and hauled them clear down below Haven dam I would have known it. They couldn't have hauled them down without my knowing it. The only stone quarries in Joliet at that time, before 1848, was above what is known as Dam No. 1, and there would be no way of getting that stone onto boats except by carrying them around the Adam dam. I know there was no stone taken from that Joliet quarry for use down the river. I have seen wires stretched across the river up above here about two miles and half; it has been since the canal was opened. I do not remember but just one place where there was some wires. I do not remember whether that fence remained there for a long time or for a short time. The river bottom at the places where these rapids and riffles were that I have testified to was stony, gravel and boulders most generally. There were some large boulders. When I was engaged on the canal a party was sent to Chicago twice with a team.

1639

*Cross-Examination.*

These dams that I have spoken about are the ones at Jackson street and Jefferson street, Dam No. 1 and Dam No. 2. The Haven dam was a third of a mile down further. Those other dams are the ones about which I have spoken.

*Re-direct Examination.*

I noticed there was a strong current that passed over these rapids and riffles; that is all I can say. A sternwheel steamer would be the smallest boat that could be used for commercial purposes, in my opinion, and I do not think it would be possible for one of those sternwheelers to get up that current in the river in high water. You could have got a flatboat 1640 up by doing what they call cordelling. Take a long rope up and hitch it to a tree and pull up on the rope. That would not be a commercial success. A man could not afford to do that for the money he could get. I have never heard of anybody trying to do that.

*Re-cross Examination.*

Cordelling is to take a long rope ahead and hitch it to a tree and then a lot of men on the boat pull on the rope. A rope ferry goes clear across the river and a pulley block hitched to it that they pull on. It has a pulley block that is put on the rope, and then there are two ropes, one here and one there, and a windlass in the middle, so they could turn that windlass and set the boat for one way, and when they want to put the boat the other way set it that way, and the current shoves it right across. I have seen rope ferries where there was no windlass. This little windlass shortens one rope and lengthens the other. What they call cordelling is that they hitch one end of the rope to a boat and the other end to a tree up the river, and then move the boat by pulling the rope hard overhand. I have seen those sternwheel boats on the Mississippi, not on the upper Mississippi, 1643 though. I never saw them on the rapids above St. Paul; I have seen them down at Cairo. The boats I saw there got along all right; the current is not so strong there. I have seen these sternwheel boats on the Mississippi that stuck so that they could not get up through the river on ac-



count of the current. I saw that at Rock Island, saw them stuck there for half an hour; you could not hardly see them move, and they kept paddling away and they would go over the rapids; they finally got over it. Going down the river where there is a rapid current with a sternwheel boat, 1644 they could hold the boat back as well as they could push it through the heavy current. If there was power enough to push it through the current, then the same power would hold it from going down through the current, but that would not help it turn a corner. I do not think I could get one around. I was crossing Treat's Island a day or two ago and I happened to notice just below the bridge that there was a quick turn there and the water run pretty near straight across. I thought that was a place they could not handle a boat.

1645

*Re-re-direct Examination.*

I think just above Brandon's bridge there was a pretty bad turn. I do not think of anything else on this subject.

1646 JAMES C. KEEN, a witness for defendant, testified as follows:

*Direct Examination.*

My name is James C. Keen. I am living in Plainfield now, but I lived a great many years in this town. When I first came here I went there, came from Chicago to Plainfield. Plainfield is in Will County, ten miles from here, between here and Aurora. I was born in '24, came to Will County in '43. I lived west awhile in Nebraska, about seventeen years. Lived in Will County from '43 to '85, then went to Nebraska 1647 for seventeen years. I was in Washington near Spokane about a year, that was a couple or three years ago. With these exceptions, I have lived in Will County all the time. I came here with my parents. We came to Buffalo by canal, took the boat from there to Chicago, then came by wagon from Chicago to Plainfield. We didn't come down the Desplaines because we came the other way. We didn't know anything about any Desplaines river at that time. I first served my time at blacksmithing, then I went into gunmaking. I carried on gunmaking a good many years on Bluff street of this town. We came here in '43 and I went back east after being here a year and was gone two years and came back here in '46. I left there and came to Joliet in '50. From 1850 to about 1885 I have lived in Joliet.

I don't know as I am familiar with the Desplaines river.

I have been up and down it a good deal hunting and fishing; been up and down it in rowboats at different places, 1648 not so very much above, but I have below. I have hunted more through Joliet Lake and down through there. Never was much below the foot of the lake. We went afoot hunting deer and such things as that. Sometimes the water would be pretty low in the river, especially where there were what we call rapids or riffles, but in the lake there was always water until we got to the foot of the lake and after that it would be just the same I suppose as it was above, that is Lake Joliet. The north end of that lake would be right here, just below the bridge that comes across the river, Brandon's bridge, and then the lower end of the lake would be above Treat's Island. In that lake there were places 1649 that didn't know anything about any bottom at all down all the way through.

The condition of the river as to depth of water would be that there would be times when there was plenty of water and then times there would not be so much. Most all the time it would be that there would be only a little water in the river over the rapids and riffles. Of course, there were times when there would be plenty of water, especially when we had our freshet. I don't know that I could tell how much of the time during the year there would be floods and freshets, some years more than others, generally speaking there would be places when you could not float a boat as large as a skiff. There would be times again when the water would be very high. There would be three months out of the year when there would be quite a good deal of water in the 1650 stream. It would be in the summer that there would be a small amount of water in the dry parts, but, of course, in the winter and fall and spring there would be water. During the seasons of the year when there were no freshets the condition of the river as to depth of water would be that there would not be very much water. I have seen it when you could walk across the river below where the old Malcolm dam used to be,—you could go across on stones. That was only in the driest parts of the season. It might be possible in the normal and usual condition of the water when there were no floods and no freshets to navigate rowboats up the river over these riffles and rapids I have spoken of. You would have to pick your channel to do that. You couldn't go any place in the river at that time. By going around you

could possibly come up. The rapids there opposite Davidson quarry you couldn't row up it at all, you might pull up.

I have pushed a skiff up and down from the upper end of Lake Joliet to the Town of Joliet, had a man with me to paddle the boat. That is at the head of the lake. There was enough

water in the river to get the boat up over the riffles. 1651 We pulled it up, couldn't paddle it very well. I never went out when the river was not flooded, the water would be too rapid. It might have been possible to take a boat up the river during flood season, but I wouldn't want to try it. There was no trouble about going down the river in flood season. I have gone down during flood season over the riffles and rapids.

It might be dangerous, I never knew of any boat plying up and down the river for commercial purposes, never heard of any such boats being used or of any merchandise or produce being carried up the river on boats to Chicago. I never 1652 knew of any such boats being placed on the river.

I have been down the river to the foot of the lake. I have not gone down to the mouth of the river upon the river, but I have hunted down there a good deal. There was a dam in the river at the lower end of the lake at Treat's Island. I think it was stone that was hauled in there mostly, but whether it washed out or how it went out I couldn't tell.

When I came to Joliet in 1850, there was a dam above in the river and that stone dam up there and the one at Jefferson street. The stone dam I refer to is the one now known as

Dam No. 1 where the Economy Light & Power Company 1653 is. There was a dam here at Jefferson street, too. I

don't know whether there was any other dam in the river in 1850, or not. There was the Adams mill there, the old grist mill and sawmill, there was a dam there. Those dams stretched clear across the river. You couldn't take boats up because there were no locks to lock them through.

Just this side of Brandon's road there were riffles and right opposite the bridge in the river, just as you strike the head of the lake, there was a little riffle there. There were stones in the river there, different kinds, what they call boulders, and they were on this rapids down opposite this Davidson quarry.

1654 I have crossed the river a great many times at that point. I have waded across. There was a road across. They used to ford there. Didn't haul very heavy loads.

You couldn't haul very much of a load up the river there very well.

Prior to 1848, I couldn't tell you much about how the farmers got their grain to market because I was in Plainfield. We got produce and grain from Plainfield by wagon and team.

During the summer season when we waded across these fords the water would be up to our knees or over sometimes. I should not think it was possible in those days to navigate a boat for commercial purposes up and down that river. I think these were fences stretched across the river, but I am not positive.

1655

*Cross-Examination.*

These places where I say the water was up to my knees, where I waded across that was on the rapids. I know the road that went down to where the grade is built opposite Davidson quarry at the head of the lake. It was cut up, showing a good deal of travel.

1656 I was in the office of Mr. Stevens here in the city day before yesterday.

Q. Now, at that time, did you make this statement or this in substance. Did you say that you were now in your eighty-fourth year of age—?

A. I am.

Q. Wait a minute. I want to read a little statement to you to see if you said it and I will let you know when I have finished. Did you say you were now in your eighty-fourth year of age, and that you came to this country in 1843; that you resided in the county continuously since that, except from 1885 to 1902 when you were in Nebraska; that you were always fond of hunting and fishing and indulged in these sports at all seasons of the year and for many years after coming to the county; that you have been well acquainted with the Desplaines river, having been up and down it many times; and that without the least difficulty, except in the very driest season of the year, there were at least six months of each year when boats of good size would come up and down said river from what was known as Haven's dam in Joliet to the mouth of the river, the only trouble being the swift water at times on the rapids at the foot of Lake Joliet; that  
1657 you remember the old road leading from the canal near and opposite Davidson quarry to the head of said lake and that the same was deep rutted as though the same had

been drawn over it; that said road ended at the west bank of said river at the head of Lake Joliet; that there was a stone quarry on the east side of said lake near the head where good stone was obtained at an early date and which may have been hauled to said river and loaded upon boats there; that the bluff or bank up through said quarry and right east of it,—that no loads could be hauled up it in those days?

A. I didn't say no loads. The biggest part of that I didn't say at all.

Q. Wait a minute. What I want to ask you now is, did you say that or that in substance to Mr. Stevens day before yesterday, that being the 15th day of January, 1908, at his office in Joliet? Now answer.

A. Now are you ready?

Q. Yes.

A. I didn't say a good many of those things because I never knew anything about any road leading to the head of Lake Joliet. The head of the lake is some little ways below where the bridge is now, must be sixty or eighty rods, a quarter of a mile below the bridge. I never crossed any road except that road we used to ford there. There was an old wooden bridge at one time a great deal lower than the one is now and it was washed away, and it was built up higher, and put in a higher bridge. I said when you got on the east side of the river it would be almost impossible to haul much of a load before all those roads were fixed.

1658

*Re-direct Examination.*

Any kind of boats would not be able to go up and down the river from what is known as the old Haven dam to the mouth of the river; might have a flat boat and go up and down. Until we got this water from the lake the river got very low; since this water has come in there would be water enough to run in between the Haven dam and the mouth of the river. As to the current of the river I should say it would be very rapid. I have not been up and down any since the water came in; I do not know of anybody having run up and down.

1660 ENOS FIELD, a witness for defendant, testified as follows:

*Direct Examination.*

I live at 223 Gold street in Joliet; have lived here two years this last time; lived in Joliet before that, in 1871 to 1880. I came to the State of Illinois in 1847; landed at Ottawa. Between Ottawa and here I have been the balance of my life, except one year in Kansas. I was born in 1834. I came to Ottawa by boat. I was born on the other side of the Catskill Mountains in New York. In 1837 my father moved from there to Ohio. We canalled from Albany to Buffalo; from Buffalo came across the lake to Cleveland, and from Cleveland to Columbus. We went there in 1844 and went to Portsmouth, Ohio; from there we went down on the Ohio river to Cincinnati. I stayed there for three years and learned a trade and I started from there in the fall of 1847 and came to Ottawa by boat, all excepting from Peru. We got off at Peru. They were teaming from La Salle through to Chicago anywhere you wanted to go. I did not come by Chicago to Ottawa. I have followed the I & M. Canal from 1854 up to '81; was employed on the canal. After '81 I ran a saloon down in Wilmington 11 years; that is on the Kankakee river. Then I went to Morris and put in an electric light plant down there and ran that for eight years, and lived there without doing anything only fishing. During the time I was employed on the canal I was boating up and down, carrying grain. I ran two or three years from Seneca on what they called the Northern Transportation boats. They ran through from Chicago to St. Louis. Have been as far as Nashville, Tenn. Took boats down the canal from Chicago into the Illinois river and back up again. 1662 I was up the Cumberland river to Nashville in 1864. In those years I became familiar with the Desplaines river, no more than to see it as we went by; never traveled it. Since I quit boating I did not fish in this river; it was too muddy. I did not see it any more between '47 and '51 than to see fellows catching fish while I was going along. I had opportunity to observe the river between here and Brandon's bridge, going up and down. In 1849, the time they were going to California, there were five steamboats loaded at Ottawa. They fetched up a hogshead of sugar, coffee and such stuff, unloaded it there. There was one boat went to Marseilles. At that time there was a dam at Marseilles. They

could not go any further. There is no doubt in my mind there was water enough to boat then to the Kankakee.

1663 I do not know as there was any freight brought up to

Chicago from Marseilles. There were teamsters running from Peru, which was considered the head of navigation, and in fact when I landed there we put our freight in a wagon and came up to Ottawa with it, and there were teams there to go wherever you wanted. Some of them would take passengers through to Chicago and some were going down. I could not say anything about whether it was a frequent thing to send merchandise from the Illinois river by means of teams prior to 1849. Grain that was raised there, we got up to Chicago either that way or sending it to Peru, going down to Utica. That was considered the head of navigation at that time. Boats used to come up from Utica and take wheat from there. I never heard of any produce or freight or grain coming up the Desplaines river to Chicago or from any point on the Desplaines river, or of any boats transporting merchandise or freight of any kind down the Desplaines to Chicago or from any point on the Desplaines. I will give

a little history. Up here from Summit this is what I 1664 have seen. The river up there run both ways in high water. Old Ogden up there in Chicago dug a ditch; it was called the Ogden ditch. I suppose this drainage ditch has that from Bridgeport down, and he dug it into the Desplaines river. That brought the water from the Desplaines down, and the State made him put a dam in there because the high water would run it right out into the lake. It was for boats going. I never saw even a skiff in the Desplaines river. There was a dam where this trouble dam is, an old dam. I can give you a little history on that. That dam must have been put in in 1833. There was a man here by the name of Beard, two of them. They laid out a town there and the old man and his wife died the same day in 1847, but they have a nephew that is out in Michigan here; he was telling me about this. He told me, this nephew, that his uncles were offered \$40,000 for their right in point in there, for the mill and all. I don't know what the mill was. There was nothing but a flume there when I commenced boating in 1854, but the old dam is there, part of it. The appearance of that old dam was there in '54.

1665 (Motion by counsel for complainant to exclude the answer of the witness because it was manifestly hearsay.)



I got this pretty straight from a nephew; his mother was a sister; she died down in Morris 102 years old. They called the nephew Doc McKeon. I don't know where he lives in Michigan. He has got a son down in Morris married to Storey Madison's daughter. I guess I have seen the rapids in the river below Joliet, sometimes observed the stage of water in the river. We were always looking over there as we were down the canal, from there down to Brandon's bridge. Sometimes the turtles took the catfish over from one depot to another; it was terribly low; the Kankakee was 1666 bigger than this; I have seen the Kankakee you could cross it without getting your feet wet and have a pair of shoes on. Generally speaking, the result of my observation during all the years I was in this vicinity is that it has been very low. There used to be a guard lock here and they would open all the gates and go right through. There was not water enough to supply the canal. They have a feeder up at Sag bridge and a feeder down at Lemont from the Calumet river. It was not possible to navigate boats up and down the river at any time that I know of. I heard of a boat down here two or three years ago, three fellows going down fishing. They came down by Morris, floating. They were drowned down below here, in the lake; the boat was sunk or something. They found it sticking in the mud. There was one or two of them could swim good, but they never knew they were drowned until they were caught down at 1667 Morris. It was only a few years ago. The Drainage was in then. There was a dam down here in the river when I first came, one on Jefferson street and one up there, the old Haven dam, and one where the Economy Light & Power Company is now. I don't remember there being a dam at Treat's Island. I see a dam up at Lockport, this side of Lockport; Norton had it in there. I never paid any attention to it. I saw there was a dam there, that was all. Never had occasion to ford the river at all. I think I have seen a stake-and-rail fence up here between here and Lockport. It ran pretty nearly across the river.

*Cross-Examination.*

1668 Thirty inches of water would be required to navigate a boat say 10 feet wide by 30 feet long carrying say five tons of freight, with a flat bottom; if she is built out of oak will draw 30 inches of water, and when made of pine

will draw about 26 or 24. We calculated the carrying about a little over 100 bushels of corn to the inch. We drew 4 feet 8 inches of water. I don't know of any rule for calculating the carrying capacity of a boat. I do not know whether it is the rule or not that the capacity of a flat bottom boat drawing a foot and a half of water is 90 pounds to the square foot. We used to carry a little over 100 bushels to the 1669 inch. Our boats were 100 feet long by 17½ feet wide. The canal boats I operated were 100 feet long and 18 1670 feet wide on deck. They would carry 6,200 bushels. The boats would draw 4 feet 8 inches of water. I will take my oath they gave us 4 feet 8 inches of water in the canal. There was 4 feet 4 one time and one time they didn't measure it at all. That load would carry on 4 feet 8 inches of water on the sized boat I have mentioned.

1671 URIAS BOWERS, a witness for defendant, testified as follows:

My name is Urias Bowers; I live in Joliet. The last time I have lived here a little over a year. I have made Joliet my home ever since 1844, but I have been away occasionally a whole summer. First came to Will County in 1844, in May. I was born in 1833; was about 11 years old when I came; have lived here in Joliet except for the absences mentioned. Have followed the water for a living most of my lifetime. My business was mostly boating along the river and canal, 1672 along the I. & M. Canal and along the Illinois river. I have made a good many trips along the Illinois river from Chicago to St. Louis. I won't undertake to say how many, but for 40 years. I had charge of canal boats plying up and down the canal. The first boat I had charge of was in '69—'60 I think it was, spring of '60. Before that I was employed on the canal; I did a little on it in 1849. In '50 and '51 I was main hand on deck; after '60 had charge of a boat myself. I ran a boat a couple of years after the Chicago fire, I think about '73. Since '73 have run boats on the Illinois river; used to go from Chicago to St. Louis on canal boats; carry lumber and flour back. Since I left the canal in 1673 about '73 I tended lock eight years, Lock 10 and Lock 12 on the I. & M. Canal—both at Marseilles, two locks close together. After I quit tending lock I came up here and

went out on a little farm out of town here about two miles and a half. Have been there ever since until a year ago last fall. I am familiar with the Desplaines river as much as I am along the canal; it runs right along the canal pretty much all the way from Chicago to the head of the Illinois river; we could see it most all the way down. There are very few places you could not see the river from the canal from

Chicago down to the head of the Illinois river. I never  
1674 was fishing or hunting much along the river. I never made it my business to go along the canal to examine the water in the river. I have been along the shores at different places, on and off. Have fished in the Illinois river and some in the Desplaines river, and some in the Kankakee river, but not much in the Desplaines. From here down two or three miles as far as Treat's Island, my father used to do a good deal of fishing. I used to go with him when I was a boy.

Q. What was the condition of the river before 1848 as to the depth of water in general?

Objected to; witness does not know and has shown he had no opportunity of knowing.

A. I don't know what you mean about the condition of the river.

Q. As to the depth of the water in it?

A. I could tell you more about the quantity of water that went over these dams than about the condition of the river as to depth of water in general before 1848. I have seen the water over this Jefferson street dam here when it varied from an inch to two feet in a season. I have seen two feet of water on that dam and I have seen it when the water did not run over it at all. As far as I have had any ex-  
1675 perience we always had less water in the summer time.

We would have a freshet in the spring. Dry seasons we had scarcity of water most all the time on the canal. We used to have factories in Joliet that got their water out of the canal. When the water got scarce they used to shut down. I remember lots of times it used to be a rule that when these mills run until the water quit running over the dams, then they were shut down. There was no water to spare for them only what the canal wanted to use to keep its regular stage of water. I remember the Jefferson street dam down here when I first came, in 1844. I remember that the dam built before the present Jefferson street dam ran cater-cornered across the channel from northeast to southwest. I never saw the

dam because it was always covered with water, but I have seen the shape of it when they dug out the Drainage  
1676 Channel. I have been aground on the dam with a canal boat. When I first came here there was no dam where Dam No. 1, the present Economy Light & Power Company's dam is. They commenced building that in '45 or '46 I think. I was employed on the construction of that dam; carried grub around for the boys. I was what they called "grub boy." There was a dam below here called Malcolm's or Haven's dam when I first came, in 1844; that is quite a little ways this side of McDonough street; that dam was clear across the river; so was the Jefferson street dam. No boat could go up either one of these dams. There was no lock in the old Adams dam. There was a space over on the  
1677 west side of that dam that was probably 12 feet wide, built out of stone, where they planked up in there to keep the water from running through, probably put there to put a wheel some day. No boats could get over these dams up stream. They might have gone down in high water over the dam. I never saw anything of that kind. I never knew of any boats navigating the Desplaines river, carrying freight and merchandise or passengers from Joliet down to its mouth; never heard of any; never knew of anything  
1678 more than a skiff or something like that navigating the part of the Desplaines river above the point where the canal comes in. Never heard or knew of any boats on the Desplaines river used for commercial purposes. When I first came to Will County in 1844, both freight and passenger traffic was conducted by teams; carried passengers with teams and hauled out stone from here to Chicago by wagon. Farmers would take their grain to Chicago by teams. My father made it a business of teaming between here and Chicago. I have seen as high as a hundred teams between Lockport and Chicago, along about 1845 and '46. I used to go with my father with a team. We used to mostly haul merchandise from Chicago here, and passengers. Father used to carry passengers from here to Chicago for a dollar; start from here in the morning and guarantee them to get to Chicago so as to get an evening boat to go out on the lake; if he didn't get them there he didn't charge them. Father came from Ohio here by team. Some places I had occasion to observe the rapids and ripples in the Desplaines river. We used to ford the river down at the Kankakee where father lived, just below the aqueduct, down where Beard's dam was. His

farm was on the west side of the river, down near 1680 Beard's dam. That was not when I first came to this part of the country. Father lived here over 20 years before he went down there. There was a place there that we always called Beard's dam, the boys that were younger than I; I have been there with them fishing. They would say, "Let's go down to the dam." There was part of the old timbers sticking out of the water. There was no remnant of an old mill that I ever saw. I do not know when I was first down there where Beard's dam was; I could not tell. I commenced boating down there along in the '60s.

Q. Did you ever hear that there was at one time a dam clear across the river known as Beard's dam, and also a mill there?

Objected to by counsel for complainant.

A. Well, I have heard that but I never saw the mill.

Q. And the evidence down there showed you when you were there that there had been a dam there at one time?

Objection by counsel for complainant to the question as leading and suggestive.

A. Oh, yes, there had been a dam there; I did not hear when that was first constructed.

Q. Now, from your experience along the Desplaines river was it ever possible to navigate up and down that river for purposes of commerce?

Objection by counsel for complainant.

A. No, I don't think it was; I know it was not. You might take a boat down but I do not see how it would ever be possible to get it up.

Q. You couldn't take a very large boat, could you?

Objection by counsel for complainant to the question as leading and suggestive.

A. Well, I don't know; there has been water enough to carry a pretty good sized boat, but then that was only just in freshets in the spring time.

The WITNESS. I should think it would be dangerous to take a boat down, a boat that had any kind of freight on it that was damageable.

Q. You never heard of its being done?

Objected to as leading.

A. Never saw a boat that carried anything up and down the river, anything that was carried for any purposes, as

grain and lumber. I have seen small boats go down the  
1682 river, fishing and hunting and trapping and such things;  
but they seldom came up. I remember once myself and  
two fellows took a skiff and went down the canal from here  
to Channahon. There we put it into the Du Page river and  
went down into the Desplaines as far as the aqueduct. Then  
we pulled her out and went over to Goose Lake, hunting.

Q. Did you have to drag the skiff over the rapids going  
down?

Objected to as leading.

A. Yes, sir.

I only remember one place, that was right after we got her  
out of the canal; close to where the Du Page enters into the  
Desplaines, there was quite a rapids there, about a quarter  
of a mile below Channahon. We put the skiff back into the  
canal; could not have got it back up the river because  
1683 there was a good many rapids along the river, and we  
knew them, and rather than pull her over the rapids  
we might as well walk back, because we would have to walk  
back over half the way anyway. So we put her into the canal  
and came back that way. I never that I know of saw any  
fences across the Desplaines river. I have seen them fence  
into the water 10 or 12 feet to keep cattle from going from  
one man's land to the other where they had pasture, but don't  
remember seeing and fences stretched clear across. It was  
along about 1858 or '9 that I was in the skiff with the two  
other people, fishing, and took the boat back by way of the  
canal.

1684 OLIVER S. CHAMBERLIN, called as a witness on be-  
half of the defendant, testified as follows:

My name is Oliver S. Chamberlin.

I live at 1112 Cass street on the bank of Spring street here  
in Joliet. I have lived here about 12 years. I lived in Will  
County 7 years at the 12-mile Grove, and then I lived in  
Cook County 7 years at Blue Island and I lived 18 years up  
on the farm and about 12 years here. The farm where I  
lived 18 years was about 5 miles and a half east on Maple  
street in Will County. I first came to this part of the  
1685 country in the fall of 1837, and have lived at these va-  
rious places ever since. I have not been away from this

general country here. I was born in 1825. I did not come by the way of Chicago; we came around the lakes. I was about 12 years old when I arrived here; it was 1837 when I first came to Will County. I did not become so very familiar with the Desplaines river in the years between 1837 and 1848. I remember seeing how it looked down here below the town, and up beside the Sanger farm towards Lockport. I had some horses on the Sanger farm, and I used to notice 1686 the river along there.

As to the usual depth of water along there, at the southern part of the Sanger farm, it was not deep. It ran pretty lively and a little deeper on up. I do not know that I ever went into it with a skiff, or measured it for anything. The Sanger farm is up above Joliet some distance; I guess about three miles. I had in those years, occasion to observe the river down below the Town of Joliet. I can remember coming down to the Davidson quarry, and I could look off into the river where it was pretty wide and pretty shallow. I did not have occasion to see the river very frequently during the different seasons of the year, at those points. I could not point out where the rapids were in the river so very particularly. I have been along the river a little sometimes when I was going to Channahon. I never tried to go down the river in a boat. I guess I have seen skiffs on 1686 the river; I have not seen them very frequently.

Whether or not skiffs were used much on the river, when I first came down here, I do not know much about it. I did not stay but a few days in town. Then we went up to the 12-mile Grove, and then I didn't get here very often; only in the winter, I came down and went to school.

1687 I don't know how the farmers got their grain to market between 1837 and 1844. I guess they must have drawn it up. About 1846, I guess, I know I was down to visit my brother-in-law that lived at the club-house; that is a little east of this old stone schoolhouse. He said he wished he had a load of grain hauled up to Chicago, and I said that I would take it for him. I took it by Blue Island, with a team. I suppose that people who traveled between Chicago and Joliet, and that merchandise and freight, were carried by means of teams. I am satisfied as well as I can be that they did. I never heard of any boats bringing merchandise or produce, or freight of any kind, down the river from Joliet until the canal boats commenced to operate. I never heard



of any boats being navigated upon the Desplaines  
1688 river at any time for the purpose of commerce. I never  
heard of it at any place on the river. I never saw  
any such thing. I do not recollect of having seen any fences  
built across the river.

No cross-examination.

SENECA HAMMOND, called as a witness on behalf of defendant, testified as follows:

*Direct Examination.*

My name is Seneca Hammond.

I live in Joliet. I came here in 1849, by way of Chicago. I came from Chicago to Joliet on a canal boat. I was born in 1837, and have lived here in Joliet and vicinity ever since 1849. My business has always been a farmer, up 1690 to within a few years. My farm was right east of Joliet on Maple street (road we call it) about 4 miles; that would be 4 miles from the river. I had occasion to transport farm produce or grain to the Chicago market. It was always done by boat on the canal. After I arrived here, the Desplaines river was always our fishing ground. I always went there fishing; that was all the sport we had those days—fishing; I went once or twice a year; we used to fish down below Joliet here where the Hickory creek empties into the river; we used to fish there, and also from Joliet up to Lockport and through there. I never was down the river below Hickory creek, above Lockport. We used to go near 1691 Romeo. I have only been along the Desplaines river below Hickory creek by wagon road. I have not seen the river much below Hickory creek. It was our custom to go fishing about May. We calculated to go when it was not very high. We had to fish with a seine; do wading; we generally found where we always waded. I went where I could find holes in the river and seined for fish in these holes. I never had a boat which we drove down to the bank with a wagon, and then waded out into the stream and used 1692 our seine. I never saw skiffs or boats going up or down the river at any time. I, myself, never used a boat on the river. I never heard of any other kind of a boat going up or down the river, nor did I ever see any. I never heard

of any boats used for commercial purposes going up or down the river at any time in my life.

Q. From your observation of the river at the points where you have fished it, what do you say as to whether it would be possible, or whether it would have been possible to navigate the river by any kind of boats?

Objected to on the ground that the witness has disqualified himself from answering the question.

A. Well, as far as I know, I do not think they could. I saw the river at these points where I was fishing.

1693 Q. Were there points in the river that even a skiff would have to be dragged over rapids and riffles?

Objected to, as leading and suggestive.

A. Yes, sir.

Q. Would it have been possible, in your judgment, to have taken skiffs up or down the river, over the rapids that you observed, when you were fishing there in the early days?

Objected to on the ground that the witness has not said that he has seen any rapids.

A. Why, it would be possible, yes, sir.

But not without dragging it. You would have to drag it over riffles, in my experience. I have seen the river in times of high water. It would have been possible to have navigated boats up or down during these times over the rapids I observed in the river, but I should hate to have been in it. I think it would have been dangerous to go down the rapids.

The current would be very swift. I do not think it would  
1694 be possible to have rowed a boat up those rapids in high water; the current was too swift. I don't think it would have been possible to have taken boats used for commercial purposes either up or down the river during the times of high water. I never heard of it being done. In the early days I didn't observe that any fence was built across the river. I saw one up here at the penitentiary when the penitentiary was built there. It was a wire fence. The parties that owned the land on the other side, built the fence there. I saw that fence about 1863 or '64, somewhere along there. That fence was a mile or two north up the river from Joliet, right beside the upper lake. I saw the fence there more than once. I climbed over there a good many times. That fence remained there within my knowledge 3 or 4 years. I don't know whether it was ever removed or not. I could not say. I don't know whether it has ever been taken away or not.

1695

*Cross-Examination.*

I have rowed a skiff on the river from the lock down as far as Joliet; I mean the twin locks up there. They must be nearly a mile up the river from Joliet. I rowed a skiff down only once; I was hunting ducks in there. The little experience that I have had does not enable me to know very much about what can be done with a skiff on a river. I do not pretend to have very much knowledge about what can be done with a skiff. I did not say that I helped drag a skiff over the rapids. If a skiff were taken over certain rapids that I saw, it would have to be dragged over.

1697 PETER O'BRIEN, a witness on behalf of defendant, testified as follows:

*Direct Examination.*

My name is Peter O'Brien. I was 75 years old the 29th day of last June. I lived at 806 Northeastern avenue. I have lived in the city or vicinity of Joliet and Desplaines river fifty-three or fifty-four years. When I first came here I was steward and porter on these packets that ran from Chicago to La Salle. I raised a company here as 2nd lieutenant and went to the war and resigned. I was nine months in and resigned. After that I fished and hunted, trapped and so on. My business to-day is just trapping. I ain't trapping now, but I am waiting for the weather to get so I can trap. I trap every winter and fall; 7 miles south here; Lake Schweitzer, that is on the Desplaines river. My trapping and hunting and fishing has generally been confined to a territory along the Desplaines river and adjacent to it. I have seen the Desplaines river in all seasons of the year. It has been very low. I have waded along from Malcolm's mill way down to Brandon's bridge, and below that 40 or 50 rods. In that territory from Malcolm's mill to Brandon's bridge, I should say there was from 6 to 8 feet of a fall. Quite a current from Malcolm's down to—way down to where we call the lake; that is, the head of Lake Joliet; that is in the neighborhood of three or four miles from the courthouse. I have never seen any freight boats plying up and down the Desplaines river, excepting a canoe or a skiff taking provisions down to camp for a week or so;

never heard of a freight boat going up or down the Desplaines river carrying merchandise. As to whether it is possible for a row boat to come up the Desplaines river in any season of the year, from the mouth of the river to Malcolm's mill, sometimes you would have a good deal of poling and avoiding these big, hard heads to get up when there was any 1700 kind of a current. They poled up small boats from the mouth of the Desplaines river to Malcolm mill. They poled up and worked with the oars. I don't know whether they were able to get their boat up through the rapids, without getting out of the boat, or not. I myself, even, had to get out to come around the edge of the abutments, before Brandon's bridge was built, in order to get up that heavy current. I would take my boat down to where the current was not as swift, and give her a good shove, so I could go around the piers; around the abutments. I might pull my boat out of the water, once in a while. I never rowed or poled a boat from Brandon's bridge to Malcolm mill. I could not, because there is not water enough and when there was water enough, I could not get up against that current.

1701 If a boat were going down the Desplaines river in times of high water, it would be likely to strike one of these hard heads. All you can see of them when it is high water is a kind of a little riffle or current around them. I often went down the Desplaines river in times of high water from Malcolm mill. I went in a small boat, but I would go down backwards, so as to avoid those hard heads. I would sit right where I rowed from and turn my boat around, turning the bow downwards—backwards, and row backwards. I would not row, I would let her go down with the current and avoid those stones.

I have seen fences across the Desplaines river. Mr. Adler had a fence there, down below Malcolm's, so the cattle would not get in the opposite place of Mr. Davidson, the old fellow who owns the quarry. The fence went clear across the river. I don't remember whether there was more 1702 than one of them. I saw it pretty often. A freshet would generally take it out, once in a while. It would start in at Hickory creek, where Adler's pasture used to be, and then cross over so it would not strike Davidson's place. They would get in any way, once in a while, and they would have to drive them out. There was a wire fence along the shore, from about south of Hickory, down, you might say, maybe 80 or 100 rods. I am pretty certain of that.

1703 As to the dams on the Desplaines river I remember Malcolm's dam and then the Jefferson street dam and then Number 1 at Jackson street, where the present dam is now.

I knew of a dam at Treat's Island. I used to go out  
1704 and wade out to where—a little above this dam. There used to be an old—kind of big logs and so on across this place; a little kind of east of Treat's Island, and I think it was for the purpose of getting water into the mill that they had a sawmill down at the lower end of this little run-way; I think that was what it was for. There used to be a dam, an old dam, in the vicinity of the mouth of the Desplaines river, a good deal like the dam that was there at Treat's Island. That dam was clear across the river.

*Cross-Examination.*

The trapping that I did was done in the winter and fall,—the fall and spring. The reason I could not take my row boat up the river was because of the swift current. At  
1705 any time when I waded in the river, it was in warm weather, in the summer time; that was the season of the year when the river was lowest. I should say it was all of a quarter of a mile over from the dam here in Joliet, at Jackson street, to Malcolm's mill. There were rapids in the river below Malcolm's dam, but not above the dam. I don't think where I waded, I could drown very easily. In some place it was 5 or 6 inches deep and in more places it was maybe two or three feet. The dam that I spoke of at Treat's Island I think was put in to have some of the water pass by the sawmill that was there.

1706 There are three channels. There is one on the west side of Treat's Island, and then there is one betwixt the main island, large island, that the race-way goes down to the mill, and then the biggest is on the east side. This portion of the river where the dam was, was not very narrow. There was quite a stream on the east side of it. It might have been as wide as a good sized road; it might have been 5 or 6 rods wide. The size of the stream on the other side of the island was about the same. Mr. Adler had a fence across through it, one time; it was just a wire or two wires stretched across; there might have been only two or three wires for that matter. I didn't pay much attention to it, but I know there was a wire there, and that it broke when there was a freshet

in the spring of the year; it would generally break it. The purpose of this fence was to keep cattle from going over to Mr. Davidson's. I think that was what the point was. Davidson used to have a big lot of quarry stone put on end for a fence in one part of his field. This fencing was to keep cattle from going from one man's field around to another. I only remember the one fence that was across the river.

1708 FRANKLIN COLLINS, a witness on behalf of defendant, testified as follows:

*Direct Examination.*

My name is Franklin Collins. I live at 201 Baker avenue, Joliet. I came to Will County with my parents in the fall of 1833. I was about three years and a half old. My first knowledge of the Desplaines river was in 1837 or '38. The dam at Lockport pertaining to the Daggett mill was either in process of construction or constructed at that time. There was a dam across the river down here a little above the 1709 old Jefferson street bridge. I think it extended across the river. I suppose there was a grist mill in connection with that dam. I never was in the building; that is the dam known as the McKee dam. As to whether or not there were any other dams in the river prior to 1848, I could not swear as to the date that the Havens boys put in a dam below there for the purpose of a sawmill. I never saw boats carrying freight or merchandise plying up and down the Desplaines river, nor did I ever hear from anyone whom I regarded as a reliable source of information, that boats carrying freight and merchandise plyed up and down the Desplaines river.

There were some places in the river where it was easily forded at almost any time, and then there were other places where you could drive right across the river. I never 1710 forded the river at all, later years. I think the first time was about 1840, '41 or '42. At that time I forded it at Lockport. I don't think I ever forded it at any other place, before the opening of the Illinois and Michigan Canal. The ordinary condition of the river as to quantity and depth of water was very little in quantity; in depth, it varied very much, from nothing to, maybe in places, two feet, perhaps.

There would be a series of holes and shallows clear across the river; also up and down the river. I have seen row boats going up and down the river for short distances. There were places where a row boat could run a few rods, and in some place I should say half a mile. When they got to the limit of row boat flotation, if they wanted to continue, they would have to carry the boat over—make a portage. There were not many row boats on the river; they were owned for purposes of pleasure. I never heard of a boat being owned on the Desplaines river for the purpose of commerce. When we came here, we came by wagon from Rochester, N. Y. We came around through Indiana. We crossed the river at Detroit, and the rest of the way through Indiana and those adjacent states that we had to touch. I frequently had occasion to go to Chicago before the opening of the Illinois 1712 and Michigan Canal. At first we used to use ox teams, and soon branched off into horse teams. There was no other way of getting produce to Chicago and getting supplies from Chicago, excepting teams at that time. There were teams in the summer, when the roads were very good; later in the fall and early in the spring, they were very bad. It was almost impossible to get through with a reasonable sized load. Before the opening of the canal, there would usually be a good many teams going to and from Chicago. There was a stage line running from Chicago down through this country; it was called Frink & Walker. I don't know its real southern terminus; it ran from Chicago south and southwest.

1713 There have been fences across the river north of here; south of here I am not well posted. Those fences north of here extended clear across the river. They used to have a swing-gate, or what they called a swing-gate in some places; they were not all alike. I don't know whether or not the Daggett dam extended clear across the river.

Q. In view of the difficulties of transporting merchandise and supplies to and from Chicago, if it had been possible to have used the Desplaines river, would it have been used, in your opinion?

Objected to, as leading and improper.

A. Most emphatically.

In my opinion the only reason the Desplaines river was not used, was because it was not capable of being used.



*Cross-Examination.*

1714 I will be 78 years old the 19th day of April. I came to this country in 1833, as a child, with my parents. When I first came to Will County, we lived in what is now called the Town of Homan. We lived there most of the time until 1870. I live 5 miles from the Desplaines river, at a place that is northeast of the City of Joliet; I would call it a distance of about 9 miles. We call the distance to Chicago 32 miles; that is, the shortest and most direct road. If there had been boats on the river, I would not have seen them, 1715 but I should have known of them by hearsay. It is possible that there might have been some boats on the river, without my having heard of it; there might have been hundreds of them, without my knowing it. The dam at Lockport was built at an early day; I think before 1840. If it was built in 1837, I was then 7 years old. Our home at that time was about 5 miles from Lockport. This dam known as the McKee dam was situated at about Jefferson street; 1716 it was in what is now known as the City of Joliet. I think there was a mill in connection with it, as it is spoken of freely as the McKee mill; I have never been to it. Prior to 1848 I do not pretend to have exact memory as to month or year. The canal was built and finished about 1848; after that, water transportation was on the canal. I would say that since about 1840. I have an accurate memory 1717 at this time of the situation; that would be from the time I was about 10 years old. I think I moved to Joliet in about 1871. I think it was prior to 1840 that I forded the river at Lockport; I think it was in 1841 or '42 somewhere; I could not tell very positively. I would not pretend to be accurate as to three or four years of a time there when it might have been. I forbid it in company with my father, with a team of horses. I think in the deepest place it was about two feet deep. I think I have a clear and distinct recollection to-day as to how deep it was. I think there was a regular drag across; it might have been a rifle; I could not say as to that. The place selected for fording would most likely be in the shallow parts of the river; I don't remember whether it was or not; generally the fords of the river were on the riffles. During the next 8 or 10 years I usually 1719 crossed the river two or three times a year; that would be in the summer time at the low stages of the water. In extreme high water, this river got to be half or three-

quarters of a mile wide in many places; I don't remember how deep it was at those times. There were no measurements and no means of ascertaining. As far as any fence was concerned south of what is now Joliet, I don't know about that until later years. There are no fences across the river south of Joliet, that I know of now. I would not swear that 1720 there ever was a fence across the river south of Joliet.

North of Lockport there used to be several fences across the river. Mr. Fitzpatrick had one; that fence went clear across the river; it consisted mostly of boards; sometimes they had a swinging fence, one that they could take out as they saw fit; the majority of them were fixed that way; I would not swear that all of them were so fixed. All fences at that time were built most any way, with almost any kind of material that they had, but usually those were boards; also there was wire. The earliest wire fence that I recollect 1721 about, is 1845. Until long after 1845, as a general thing there was no wire to be used for fence or otherwise.

Whatever was of wire at an earlier date, was made by a home blacksmith, or something of that kind, and strung across the stream. Rods were stretched across, and swung on what was a swinging gate; they were usually small rods, almost approaching wire. I remember distinctly of such rods as that being used in fences. I would not swear it was used there, but I will swear it was used north of there on Spring creek—across Spring creek. These rods or wires varied in length; I should say they were from about 15 feet to 2 1722 rods. In setting them across the river, posts were set in the river; they were mostly of wood; a few of iron. I do not know where they got that material to make those fences. I may be slightly mistaken in the date as to any wire or iron fence being put up as early as 1845, but I don't think I am very far off.

1723 JOHN McCOWAN, a witness on behalf of defendant, testified as follows:

*Direct Examination.*

My name is John McCowan. I live in Joliet. I was born in 1826. I first came to Will County before Will County had been made. I first came to this territory adjoining the

Desplaines river on the 28th of May, 1835; I was 8 years old in December, 1834; I came from Columbia County, State of New York. We came by wagon to Albany and got on a canal boat at Albany and came the whole length of the Erie Canal to Buffalo; then we got on a steamer at Buffalo and took that to Detroit; from Detroit to Chicago, we came on a 1724 2-masted schooner called the "John Jacob Astor."

From Chicago, father hired a man, and he had to get an assistant to help him—another team. It took us one whole day to get the first 9 miles, because of mud and water. There were no roads at all in those days, from Chicago out. We had to unload and carry it to where they could set it down without being in water, and drive up and then load it 1725 over. We started from Winterberry's Point a little after sunrise on the 26th day of May, and got to Joliet at sundown.

Q. Describe the difficulties, if any, in coming from Winterberry's Point to Joliet?

Objected to.

A. It was a wet season of the year, and there was a great deal of mud; we did not have to again unload our goods; we took them all on one wagon from there. We were heading for Channahon, but we did not know anything about what there was down there, so we came to Joliet and 1726 laid over two days. From there we went down to Channahon. We went down about a mile from the southwest end of what is called the Wide Water. I refer to the Wide Water on the Illinois and Michigan Canal. There was nothing but a big slough then, because the canal was not built until 1848. From 1835 I lived in the vicinity of our location at Channahon for 39 years. On a direct line, we were a little over 3 miles from the Desplaines river. Old Mr. Isaiah Treat had a little grist mill and as soon as we got corn ripe enough and then dried it enough, we gathered it and dried it out around the stove pipe and shelled it and took it over to that mill. I personally went with the corn to the mill. The first time I went was in 1835; that mill was in operation at that date. I waited until the corn was ground into meal and took it back with me. There were two dams, one standing across each branch of the river. He had one run of stone in the mill. It did not take a great while to grind our corn. I never took only 4 or 5 bushels at a time because it was then green, that year's growth, and of course would not keep very

long. I lived on the right side of the Desplaines river, 1728 going down the stream. I got to the mill by going across both branches, because the mill was on the east side of the east branch. I had occasion to cross the Desplaines at other points and other times before 1848. I crossed at the foot of Treat's Island, and I crossed down, over near where the Smith bridge is at the present time. The bridge is not exactly on the old ford, but it is very close to it. I have crossed the river here in Joliet at just below what used to be the island. It would be about half way between Exchange street and McDonough; that was where the ford was in the early days. There was a dam in the river at Joliet in 1729 1836. I don't remember whether there was in 1835 or not, in 1836 McKee had a dam and a grist-mill. One thing that fixes that date in my mind is that father took some wheat there of the growth of 1836, and he had some trouble in getting his pay. I didn't go with him to the mill but I had been past it several times between 1835 and 1836. Don't know whether that dam was in in 1835 or not; that dam extended clear across the river; there was only one branch here. I don't remember of a dam being located below what is known as the aqueduct near the mouth of the Desplaines river, 1730 near a place called Beardstown in the early days. I remember the locks were constructed in Channahon. The stone with which those locks were constructed first came from what was called afterwards the Alexander quarry; that is on the east side of the river, or the left-hand side going down stream. They got the stone from Alexander's quarry across the river on stone trucks hauled by horses. The locks were constructed in 1846 and 1847. I remember the construction of what was known as the aqueduct. I could not say whether they got the stones from which that was constructed at Beardstown, or whether they got them at Alexander's. They had quarries down there at what is called Beardstown; 1731 that was just before the conjunction of the Desplaines and Kankakee but I don't know that there was anything there except standstone quarries, that is to get stone heavy enough for aqueduct purposes.

I have never seen boats plying up or down the Desplaines river carrying merchandise or passengers. I never heard of any such thing; there were trappers' boats, skiffs—little boats and skiffs. I never went up or down the Desplaines river in a skiff. I have seen trappers with skiffs. I have seen them all the way from the Davidson quarries clear to

Treat's Island, and I have seen them as far down—but there did not many of them go beyond Treat's Island—but I seen a few down as far as the Smith's bridge. Part of the stretch of river from the Davidson Quarry to the head of 1732 Treat's Island is known as Lake Joliet. I have not seen a skiff go all the way up the river from the head of Lake Joliet to Davidon's quarry; I have seen them at different places. The current in that stretch of river was pretty swift; the first two miles and a half was pretty swift; a good deal of a fall. A row boat could be rowed up that current, but it would not be much fun. I never saw one rowed up there, and I never rowed one myself.

The first time I was in Chicago after 1835 was in the fall of 1842, and then from that until the opening of the canal we were there every year, in the fall of the year, with produce, wheat principally. We got to Chicago with a team.

We passed a good many other people on the road going to and from Chicago. That was the only way of getting produce from this territory, and below here, to Chicago that I ever knew, and I have lived within three miles of the Desplaines river since 1835 and up to the present date. I don't think it would be possible for boats to have gone up or down the Desplaines river since 1835 and up to the present date.

Q. Would it have been possible for boats to have gone up or down the Desplaines river carrying merchandise without your knowing it?

Objected to.

A. I don't think so, because I think it would have been such a memorable thing that it would have been talked about.

Q. In those early days, when travel by team to and from Chicago was so difficult, would the Desplaines river have been used, in your opinion if it could have been used?

Objected to.

A. It could not be used for transportation, that is unless it was in high water flood, or in the spring. If they had steam powerful enough to counteract the current, I guess they could have used it in high water, providing the boats did not draw too much water.

1734 Q. Did you ever hear of anybody owning a boat on the Desplaines river for the purpose of carrying merchandise or freight up or down?

Objected to.

A. No, sir.

Q. When you came to Chicago, did you inquire as to the methods and means that could be—that were available for getting into this country?

Objected to as suggestive and leading.

A. My father did. I didn't.

Q. Did you adopt the only available means there was of getting into this country?

Objected to.

A. There was no other available means of getting into this country at that time. I remember the Haven Dam in Joliet, sometimes called the Malcolm Mill. I could not tell exactly when that was constructed.

1735 I have walked across the Desplaines river down there at Treat's Island. Where I went across there was none of it over 16 inches deep, and some parts of it were not more than 6. Nigger heads and boulders were pretty numerous in the channel near Treat's Island.

Q. Was it possible to step from stone to stone across the river?

Objected to as leading.

A. I have walked that way.

Q. Went over dry shod on the stones.

Same objection.

A. Yes, sir.

I have seen a few fences clear across the Desplaines river.

1736

*Cross-Examination.*

I was born in 1826. I came here with my father in the spring of 1835. My birthday is in the month of December. I guess I must have been eight years and a half old when I came here. I learned a good deal about means of travel from the time I started until I got here. Of course I didn't know anything about travel until I started. I knew nothing about this country through here and from Chicago until I came. I didn't make any inquiry and look about to find the best means of getting down from Chicago, but I heard my father talking. I know that I came from Chicago here with teams, and I know that for the first 9 miles after getting out of Chicago, the roads were very muddy. There was not much Chicago there at that time. We started from what was called the "Old Green Tree" house, across from the "Indian Agency's" house. John H. Kinzie was the Indian agent there at that



time. I don't know anything about a "Mud Lake" near the City of Chicago; I never heard of it. I haven't heard of boats crossing between Chicago river and the head waters of the Desplaines in high water time. I have heard that the waters connect in high water time; that is, the waters of the Chicago river and the Desplaines river. I could not say when I first learned about it; it was previous to '48, but I could not locate the year that was, as I understood, at the time during a great flow of ice that caused the waters to dam up in the Desplaines. I didn't learn where the ice was located, but I read that in the newspapers. I just know, in a general way, the fact that in very high water there was water connection between the Chicago river and the Desplaines river, and that in low-water that connection didn't exist.

I never heard of the name "The Portage." The first year I went to Chicago, after I came here, I think was in 1739 1842; I went with a team, with my father. I took some grain up; we had two teams; I drove one and he the other. I made no personal inquiry myself as to how I could get down here from Chicago, but I was always with my father when he was talking with the teamsters and others, and I heard all he said pro and con. He was talking to different ones—to the hotel-keeper and others. He talked with the hotel-keeper first, because he had to get the address of the teamster from the hotel-keeper. He inquired where he could find some teams or teamsters to bring him down, and the hotel-keeper directed him to one certain man having teams; then my father went to this man and engaged him to bring him down with his team, and I heard that talk. My father's inquiry at the time as to how he could get down here was all that I heard.

1740 Nine miles out from where we started in Chicago it was very wet and muddy and the water was on the prairie there were no roads at all. Concerning the depth of the water that we drove through, as the saying is, the tires and felloes of the wagon were very wet; it was all the way from two or three inches, up to two feet, in places. I cannot say how far up the Desplaines river went; I don't know today how far up it goes toward Chicago, but I know the Desplaines river and the south branch of the Chicago river come together in high water. Of course we must have been between the south branch of the Chicago river and the Desplaines. The condition that I have described existed all



the way across that stretch of 7 or 8 or 9 miles that I traveled the first time. I forded the Desplaines river down near the location of what is called the Smith's bridge. It must be 10 miles below Joliet; that is, below Lake Joliet. That bridge would be in the neighborhood of 3 miles below the lower end of what is called Lake Joliet it might be more and might be less; it is right in Channahon. Where I crossed there was a pretty swift current, but I would not say there was much riffles there. The rapids were further up stream; it was at a place where the water was running quite rapidly. It must have been a shallow part where this ford was, because we went through there with wagons very often. It would not more than cover front hubs. I don't know the difference between deep and shallow in that line. If you get water 6 feet deep, you cannot ford it. I forded there at all times of the year when there was not a flood. I hauled three hundred loads of stone from the Alexander quarry. I took the stone home, the greater part of it. From the Village of Channahon, it was just about one mile and a half to the Alexander quarry. The quarry was right in the bank of the river, that is, as soon as you went across the flat, about 30 rods, I should judge it was, there the quarry was there in the hill. This 1744 ford where I crossed with my loads was about 30 rods, as nearly as I can tell, below the Alexander quarry. The water at that ford was a little more sometimes than enough to cover the front hubs of the wagon; the lowest would be probably just over the front hubs. From the Alexander quarry, Treat's Island is up the river; I should think it was about a mile and a half from the quarry to the lower part of the island. I have seen skiffs on the river all along from Joliet to Channahon, going both ways. Part of the way the current was so rapid that it was hard to get a skiff along, especially on the rapids, and there was quite a number of them. A good deal of the way from Joliet to Channahon is rapids. I know where Davidson's quarry was; that was about a mile and a half above the head of Lake Joliet. Davidson's is not right across the canal from the head of Lake Joliet.

*Re-direct Examination.*

Those skiffs that I have seen on the river were used for the men to trap and fish. Away back in the early 40's and

late 30's, most everybody had a skiff that lived anywhere near the river; they were for the purpose of recreation and trapping and fishing. When I first came to Chicago, the name of the hotel I went to was the "Green Tree House." I was with my father when he made inquiries as to how to get into this territory.

Q. And do you remember whether he discussed with the hotel-keeper where he intended to go?

Objected to as not being fair re-direct examination.

A. He told him he calculated to go some place below Joliet, but he didn't know just exactly where. The hotel-keeper had no map that showed the location of the territory, that I know of. I didn't see it, anyway.

Q. Is that the question he asked the hotel-keeper, "How can I get to Joliet?"

Objected to as not being re-direct examination, and suggestive.

A. Yes.

Q. What did the hotel-keeper say?

Objected to.

A. The hotel-keeper told him he would have to get a team and team through.

Q. Then did your father ask where he could get a team and was he directed to a man who did teaming business?

Objected to.

A. Yes, sir.

1747 Q. At that time I suppose there were men in Chicago who made it a regular business of taking people into this country?

Objected to.

A. Yes, sir; because they took us, and I suppose that it was the same way with everybody. Of course there were the teams going in from the country, as there were years later.

Q. Do you know how far from Chicago down the river they went in teams with merchandise?

A. Down the Desplaines?

Q. Yes, down the Desplaines river and Illinois river, to what points they went down with teams?

Objected to as not proper re-direct examination.

A. Well, I know they did go with teams as far as Morris. I don't know of any below that point.

Q. Do you know of any merchandise going up the Illinois

river to points on the Illinois river and then being hauled by teams into this territory?

Objected to as suggestive.

A. No.

I don't think there was any.

*Re-cross Examination.*

These skiffs that the trappers had on the river were used to take the trappers out to where they set them. They brought back the furs, mink and muskrat, which were principally the animals being trapped at that time, and once in a while they would catch an otter and hippopotamus,—no, I don't mean that; possum, that is it. There were a great many people engaged in the business of trapping in the early days; everybody, most, was a trapper that lived anywhere near that stream. I have known one man, and that is the only one that I knew personally how many he had. He had 200 traps that was principally for muskrat. This man didn't happen to want to use the Desplaines river, he had plenty right between where he lived and I lived, in the big slough there in wet weather. Others that did use the skiffs, used them to carry these traps out and set them at different places. They went every morning and gathered up what they had caught and skinned them and brought the skins in. Game of that kind was very plentiful here at that time. I was not acquainted with those men that were on the river, but I knew that was their business. Charley Smith, probably a good many people know him, or know of him, was a great fur gatherer. He didn't trap any himself; he bought furs from the farmers and others. Most of the trappers in the early days—away back about '40—most of them lived right here along the river bank and had a skiff of their own; they were not what you might call professional trappers; the professional trappers came a little later, in 1835 and '38; they came from Chicago and some other places. I don't know anything about above Joliet, but below Joliet they trapped as far as I know down to the mouth of the Kankakee. According to Schoolcraft, when the Desplaines and DuPage come together they form the Illinois, and that junction is about 2 miles, maybe a little more or a little less, from the junction of the Kankakee. My understanding is that it is the DuPage river and the Desplaines river that form the Illinois river, and the

Kankakee empties into the Illinois about 2 miles below the head of the Illinois. I know where the Economy Light & Power Company has commenced to build a dam. It is down at Dresden Heights. I have been down there. I was 1751 down there last September. The Economy Light & Power Company were at work then building their dam. I didn't see them building their dam. I know the point in the river where the Economy Light & Power Company started to build a dam; I know they are reported to be building. There are a great many who have the idea that that is on the Desplaines river, but the old Indians that were roaming around here in 1835 have always said it was the Illinois just as soon as the waters of the Desplaines and DuPage came together, and I think it is borne out in Schoolcraft's Explorations, and one thing and another, of the Mississippi Valley. I know that is what they always said. They appeared to be Indians that were well informed. No, I didn't know Shabbona.

1752 R. W. KILLMER, a witness for defendant, was examined in chief by Mr. Munroe, and testified as follows:

*Direct Examination.*

My name is R. W. Killmer. I live at 513 Herkimer street. I was 86 years old last month. I came to Joliet in 1844. I was 22 at that time. We came into this territory by wagon from Cleveland. Between the years '44 and the opening of the Illinois & Michigan Canal, I was farming in the Town of DuPage, and had all our grain to haul to Chicago. I went up lots of times, and considerable grain to haul. We met very many people on the road. There was no other way of getting grain to Chicago. There was no other way of getting supplies or produce into this territory from Chicago than by teams to my knowledge. I never saw any kind of 1753 freight boat or boat carrying merchandise or freight, going up and down the Desplaines river at any time.

Q. Did you ever hear from any creditable source that any boat carrying merchandise or freight ever did go up or down the Desplaines river?

A. I never did.

I had occasion to ford the Desplaines river at Goose Lake.

My farm came right down to Goose Lake up here above Lockport. I often crossed there, because my cows ran down to the river, and in a short time they would cross the river over to get better food, so I had to go and get them occasionally. Many a time I had to do it. At those times I would cross on horseback. I have crossed the river above there and below there. I guess I never crossed it below Joliet. I think

the Daggett Mill was in the Desplaines at Lockport when 1754 I came here in '44. I know I went to mill there often.

The depth of the water in the river in ordinary times, excluding the time of extreme freshet or flood, was rather slim for navigation purposes. That would be my opinion. I can't see how boats could navigate it at that stage. The roads between my farm and Chicago in early days were not any too good, because it was a rainy season.

Q. In your opinion, if the Desplaines river could have been used for any useful purpose of commerce before any opening of the Illinois & Michigan Canal, would it have been used?

Objected to.

A. Well, in my judgment, I think it would.

Q. Then, as I understand you, in your opinion the reason why it wasn't used for commercial purposes, was that it was not capable of being used.

Objected to.

A. Well, I would think if it could have been used, it would have been used of course. That would be my opinion.

Q. Were there times in the Desplaines river when there was scarcely no water running over the riffles?

Objected to as leading and suggestive.

1755 A. Yes, there was very little running over.

I have run my fences into the river a little ways, not very much. I don't think very many of those owning farms along the river, did that. I can't remember anybody running across the river at the time I am thinking of, because there was no wire, but maybe they have since been using wire.

#### *Cross-Examination.*

I said I had not heard from a creditable source of any boats being on the river. What I meant by creditable source, was where a man of noted credibility for truth and veracity, would tell me such a thing that I could believe him.

1756 Where I crossed on Goose Lake, the water was pretty nearly up to the horses' belly, almost all the time when I crossed there. It was about  $2\frac{1}{2}$  feet deep, a small horse.

As to how much water would be necessary for navigation for commercial purposes, that depends on the craft some I should think. When the canal was opened, I boated on this canal a little. Four feet of water was all that our boat would draw and go aground at that. I should say four feet of water according to my experience, was necessary in order that profitable commercial navigation could be had. And when I said the water was rather slim in this river for navigation purposes, I had in mind that there ought to be 4 feet of water. The river was very rapid at the time I had

1757 occasion to cross it. In the summer time there wasn't no flood or anything of that kind. It was in the low stage of the water. The place where I crossed wasn't a rapid place. Goose Lake in low water had no very great current. The roads to Chicago were pretty bad at certain seasons of the year; in dry weather the roads were good. In wet weather they were muddy and bad. The same condition prevailed all over this country in an early day.

I have forgotten how big a town Joliet was when I came here. I did know, but I have forgotten. It wasn't very big in '44. It was just a little village at that time. People 1758 as a rule were poor people.

At that time Governor Matteson was the big man. He kept store in Ottawa street, I think. He was one of the biggest men I know of at them times.

Q. Those men were not any of them able to own and operate boats that would cost a thousand or two thousand dollars apiece, were they? Take the farmers that lived round you, and the men that lived in Joliet at the time.

A. No, as a general thing, that class of people were striving to fix their homes and farms.

The only means these people had of moving themselves, with their products, was by teams. They had no boats, and I don't know but they might have been able to have them, but I don't know it.

I went to Chicago once myself with an ox-team, and 1759 saw plenty of others on the road. I don't know whether the ox-team were the principal means of hauling rather than horses. We had prairie schooners that came from the

south of here. A prairie schooner was a covered wagon, with 3 or 4 yoke of oxen on it.

*Re-direct Examination by Mr. Munroe.*

Q. Did you ever hear from anybody whether creditable or incredible, whether the boats for the purpose of commerce ever went up or down the Desplaines river?

A. No, I never did.

Q. Did you ever hear of anybody owning a boat on the Desplaines river, for the purpose of carrying commerce?

A. Never did.

The canal was opened about four years after I came here. As soon as the canal was opened, we took warehouses in Lockport, and from our neighborhood took the grain there. As soon as the canal was opened, that was the method of communication between Chicago and Joliet, and was used by the farmers.

1760 I never knew a farmer sending his grain on the boat.

He generally took the grain to the warehouse and the warehousemen loaded it on the boat, and sent it to Chicago.

TESTIMONY.

3222 ROBERT MOORE, witness called by defendant, testifies:

Am approximately 70 years old. Reside at St. Louis. Am civil engineer. I have been the largest part of my professional career employed in the location and construction of railroads,—with lines that have been merged into larger lines or systems. Witness mentions several railroads that he assisted in building and says, I have also constructed a terminal system in St. Louis for the Merchants Bridge

3223 Terminal. Have had much to do with the construction of the Southern Illinois, part of the Southern Illinois and of the Southern Missouri. I have practiced my profession about 45 years. I have served as consulting engineer for (witness mentioned several railroads). I am now consulting engineer for Chicago, Burlington & Quincy

3224 Railroad. My work as a civil engineer has brought me into the work of river terminals, their location, con-



struction and protection; protection from the action of the water, from the floods and the erosion by the currents. This includes protection from the Mississippi river. I have 3225 built river terminals in the Mississippi river at St. Louis and fifty miles below at St. Genevieve, two in each place.

I was sewer commissioner for four years and as such was a member of the Board of Public Improvements. I was a member of the Board of Engineers appointed by the President to pass upon the plans and the value of the work at the mouth of the Brazos river, and the value to the Government. The year 1897. That work consisted of jetties built out into the river to deepen the channel and to resist the action of the waves. It is on the Texas coast about forty miles west of

Galveston. Those works are very extensive and I am not 3226 sure whether they are in existence now or not. In

1899 I served as a member of an engineering board whose task was to prepare a plan and an estimate for a deep water channel in the southwest pass of the Mississippi river. The Eads jetties is the south pass. The southwest pass is now the greater channel. The plans and estimates 3227

were substantially carried out with some changes. I was occupied about a year in that work. My recollection is that our estimate was about six million of dollars. In 1896 I appeared before the Southern California Harbor Board, to present the case for the San Pedro harbor; that was followed by a report of the board in favor of San Pedro, which was ratified by Congress. I have had occasion to consult flood conditions in locating the river terminals in the Mississippi and in locating railroad crossings; at every river you must consider the flood condition.

3228 In the year 1904 or 1905 I was appointed on behalf of the owners of bridges over the Kaw river in Kansas City, immediately after the flood of 1904, a body consisting of some seven or eight railroads, and the Union Stock Company, which had a bridge over the river, to report upon the practicability of regulating floods of the Kaw river. After a very exhaustive study of the subject, I did report a plan with an estimate. I think the work was not carried out for the reason that a local board intervened which has tangled it up so that I think nothing has been done. It included all the owners of bridges over the Kaw except the city and county. Beginning with the year 1899, I have, every year, periodically inspected all over the river crossings of the Burlington system, of the Mississippi and Missouri rivers.

On the Missouri, near the mouth, is a crossing known as the Bellefontaine crossing; the next one is the Kansas City crossing, above that is the Roulo crossing; next above that is the Nebraska City and next is the Platte crossing 3229 which is the last one owned by the Burlington. I have also less critically examined the Atchison crossing and the Leavenworth crossing over which they run trains. On the Mississippi river crossings, there is the Quincy, the Burlington, Rock Island, and Winona. My examination of these bridges was with reference particularly to the maintenance and condition of the superstructure and the substructure of the bridge itself, but the point requiring chief attention has been the river protection work, work designed for the protection of the bridge and the railroad from erosion and destruction by the Missouri, mainly the Missouri, 3230 because that is an especially unruly stream. My work has informed me as to the effect of rivers and the wash of rivers upon earth and banks of rivers. When I spoke of river terminals that included river inclines, that is at St. Louis and St. Genevieve. I have been vice-president of our local engineers' club at St. Louis; I have been president 3231 of the American Society of Civil Engineers. Am a member of the Institution of Civil Engineers of London. I have had occasion to study the effect of rivers or pools upon earthen, artificial embankments. My father was an engineer and builder of canals and my earliest recollections are hearing his discussions, so I was brought up in an atmosphere of canal engineering. My father had to do with the White Water Canal in Indiana, built in the early '40s. My father's 3232 father I knew very well. In his early life he was an engineer on the Erie Canal and then on the North Branch of the Canal of the Susquehanna, canals of Western Pennsylvania, particularly the canal from Beaver to Erie. I think he located and partly built the West Pennsylvania Canal. I visited the Desplaines river at Dresden Heights at the proposed dam of the Economy Light & Power Company yesterday. I examined the towpath bank at that point—I mean at the point indicated on the map shown. The character of the material as granulated clay or clay interspersed with gravel, with somewhat large stones. I class that as very desirable 3234 material for the construction of a bank of that character. Assuming that the dam will raise a pool which will flow on the towpath bank, on the river side, to a point seven feet below the original level of the towpath, before

this two-foot addition had been made, in my judgment, I should not expect any injurious effects. If there was a very large pool unprotected there might be an injurious effect, due to waves. It could be avoided by covering the banks with riprap. Riprapping is not a very expensive operation. The necessary protection there could be accomplished at a moderate expense. I think there is no engineering difficulty in protecting that bank against any such wave action. Not  
3235 all of it would have to be riprapped. I went up to Channahon. Following the towpath bank at a number of points, the bank is very shallow and would require no protection at all. At other points it is at present very well protected against the action of the waves by dense undergrowth of trees and brushes. Roughly speaking, I should say half of it is protected in that way. I have seen the plans of this proposed work. I do not know what the estimated cost  
3238 of building the dam is. I would not undertake to estimate that. I have not measured the height or length so I could only give the unit cost approximately, that is the cost per foot, assuming a certain height of the bank. I estimate the cost of riprapping the banks 12 feet in vertical height, it would be measured on the slope 27 feet, \$3 per running foot of the embankment; that is measuring a foot along the embankment, which for a mile would be \$15,840 per mile. I expect that that cost would cover a very large part of the banks, a good deal of it is less than 12 feet and some of it is more than 12 feet high. If 16 feet in height it would be 36 feet on the slope, that would be \$4 per lineal foot, or \$21,120 in the mile. I should say that the latter figure was an outside figure. This riprapping, carefully placed twelve inches thick to the top of the bank. I feel confident that would be sufficient to protect the bank. I think there would not be danger of injury to the bank, assuming that the level of the pool is about seven feet below the original level, from satura-  
3240 tion of the bank. I examined the towpath bank in this sense. I saw soundings made by one of our party as to the depth of the water, out toward the center of the canal and at another point I actually sounded myself from a skiff, and I found that for several feet from the water's edge, it was approximately level and then broke off with quite a steep slope. First of all the earth embankment on the canal side has been somewhat wave worn and it is very nearly vertical toward the water's edge. Beneath the water there was

a depth yesterday of 12 to 18 inches for three or four  
 3241 feet from the water's edge toward the center of the  
 canal. At that point it breaks off at a very much  
 steeper slope, I should say 45 degrees. There is a bench  
 there three or four feet in width. (Witness shown map  
 marked for identification as Woermann Ex. I, Atlas, p. 3958;  
 Appendix, ..... ) Near the location of the power  
 house some new stones have been piled on the water edge.  
 I cannot state from personal knowledge whether that stone  
 goes beyond the bench into the canal or not. From my ob-  
 servation there I do not think five feet of the navigable chan-  
 nel of the canal has been filled up by that rock. I don't think  
 it would make any difference in regard to danger to this tow-  
 path with such a pool on the river side from vermin, musk-  
 rats, crawfish, etc., than there would be without the pool.

3243 I observed the old piers standing in the middle of  
 the river above the dam. I went out to the water's  
 edge and saw them. They were said to be piers of an old  
 aqueduct feeder. I would not undertake to restore the  
 3244 aqueduct box on top of those piers in their present con-  
 dition. They are badly disintegrated. I do not think  
 I would carry the water by an aqueduct of such nature as used  
 to be carried upon those piers. I should think it would be  
 better to carry it by what is known as an inverted  
 3245 siphon by iron or concrete pipes. It is simply pipes  
 that join together so the water will not come out of  
 them, which are laid on or below the bed of the stream, and  
 then brought up to the desired level on each side; simply a  
 downward bend in a closed iron pipe. The existence of the  
 proposed dam would not be an obstacle to carrying the water  
 by such an inverted siphon. As I understand the condi-  
 3246 tions the existence of the pool created by the dam would  
 present no obstacle to boats in being taken into the  
 Illinois and Michigan Canal from this feeder. You could  
 provide locks which would let you in from either side.

Q. I show you a blueprint or a profile of the Illinois river  
 and of the Illinois and Michigan Canal, marked Woerman  
 Exhibit 2. State whether or not in your opinion Desplaines  
 river as shown by that profile, was a navigable stream.

A. I have examined the profile. It shows at one point,  
 through the City of Joliet, a water surface which is approxi-  
 mately from six inches to eighteen inches above the bottom,  
 that bottom being largely rock, as I understand from my ob-  
 servation yesterday. I should say a condition of that kind

was inconsistent with navigation in a commercial sense. At a point further down, it is also a much steeper slope, which at one point, where the surface of the water almost touches the bottom, certainly less than a foot deep, on which I should say the same thing. That is a very steep and a very shallow channel, somewhat deeper until we reach a point near the mouth of the Kankakee, where it is an old dam where the depth is approximately zero—I suppose on the dam—but very shallow, even without the dam. It would be very near the proposed Economy dam. I think it is a short distance above it, near the mouth of Desplaines river. I should not call the river navigable at that point. Yesterday I went from Joliet to the mouth of the river. Our route was rather circuitous and not along the river. I saw it in Joliet from the Rock Island bridge. I should say that on yesterday I didn't conceive of any commercial navigation that would undertake it.

*Cross-Examination.*

3250 I will be 70 years old my next birthday. Commenced engineering when about 25. The principal work was in railroad engineering. Was chief engineer for Merchants Bridge Terminal Railway, St. Louis, on both sides of river. There is a steel trestle for cars. The work was substantially laying several railroad tracks that center at the end of the bridge. No hydraulic features were there. I was consulting engineer for two terms for the Terminal Railroad Association of St. Louis, which owns the Eads bridge. The work there was similar to that just mentioned. I was identified with the Cleveland, Loraine & Wheeling before it was merged as part of the B. & O. We crossed the Tuscoras river in one place, put a dam across it and diverted it into a new channel. I was identified with a branch of the B. & O., running southeast from Springfield. Except as incident to the crossing of streams, there was nothing exceptional there.

3253 Was identified with the Illinois Central from St. Louis to Springfield. There was nothing about that different from ordinary railroad engineering. In Southern Missouri we had direct contact with the Kaskaskia and Mississippi rivers. We crossed the Kaskaskia but ferried across the Mississippi. Locating a ferry at right angle is a matter of difficulty. The river terminals mentioned are perhaps called car ferries, two of them were for the crossing

of the Southern Missouri the other was a terminal built for the Illinois Central and one which had failed for the Vandalia.

3255 Q. Let me summarize: Was there anything in any of those matters other than the ordinary railroad building and the connecting of a railroad track with a ferry?

A. Well, the building of an incline, which shall be successful, involves a consideration of the regimen of the river and your ability to protect it after you have built it. The one which I rebuilt for the Vandalia, had failed because of the faulty location and had been considerable source of trouble and expense for many years. I was consulted in the matter. I relocated it, and rebuilt it, and it was practically successful.

3256 A delicate proposition is locating and building it properly and protecting it against the action of floods and ice.

I was sewer commissioner in St. Louis four years; that had to do simply with the sewer system, to get rid of the sewage of the city but there were some serious problems in connection with it. We put in all kinds of sewers, one very large brick and stone one, 20 feet high. I did not make the  
3257 original design. The construction had begun before my administration. I extended it and I had occasion to note some defects in its original design. I suggested changes and they were adopted, although completed after my resignation. That sewer was constructed more than 30 years ago. It broke out in high floods at one time; I do not mean to say it went out of service. There were two breaks in it, before I took charge of it. It was afterwards repaired and is in use to-day.

3258 A private syndicate of gentlemen living in Chicago attempted to build the harbor on the Brazos river in Texas, 40 miles west of Galveston. There were walls, mattresses and stone called jetties, which were built mainly to confine the waters of the Brazos river, so that it would scour out the mud and maintain a navigable channel. There were jetties similar to those built by Eades at the south pass of the Mississippi. The work was to control the current of the Brazos river so that it would scour a deep channel, to secure deep water.

Q. Is it not the truth that the sand or silt coming down the river, deposited itself just outside the mouth of the river in the gulf and formed a bank that the boats couldn't get over,



and wasn't the problem to build some stone walls so as not only to cause the current of the river to wash but to have the currents of the ocean catch all sand and carry it away, so it would not form again.

A. After the material had been carried out to the end of the jetties, it was hoped the ocean would do the rest. It was not absolutely successful but relatively unsuccessful. They didn't get the depth of water they anticipated; in that sense it was unsuccessful. The contemplated navigation at the

3260 Brazos Harbor was an ocean going commerce. In 1899

I served as a member of engineering board made up of two army and two civil engineers, to make plans for the outlet of the Southwest Pass of the Mississippi River. I was one of the civil engineers. Pass a Loutre is a wider pass but the Southwest Pass is deeper, except at the mouth. It

is the best pass from the point of navigation from all 3261 of them. There are three passes at the mouth of the

Mississippi River; the one further west is the Southwest Pass and the one further east Pass a Loutre and the middle one, South Pass. For the last thirty years commerce has

gone out of the South Pass. As to whether it is true that engineers have estimated that 45 per cent. of the water of the river goes out of the West Pass, about the same amount out of Pass a Loutre, and about 10 per cent. out of the South Pass, will say I don't remember the figures, but I am quite

sure that is not true. The Southwest Pass is deep 3262 water. The depth of the Southwest Pass, through the greater part of its length, is from 50 to 60, sometimes 90 feet, with shallows at the upper end and a bar at the mouth. That was its normal condition. I think the depth over the bar at the upper part was 18 feet, perhaps 20.

The problem we had to do was to find means of deepening the waters at these shallow places, to get rid of the sand bank and to take it away. The government has taken that sand bank away, cut a channel through it, and the material, which was the obstruction, has been taken away. Part of it was done by building stone walls in the ocean until the current washed it out; the rest was to dredge it. We expected both agencies would be used, the force of the current, aided by dredging, and in all probability, a dredge would be necessary to be kept at hand, to keep it open hereafter.

Being asked if I am not mistaken about that, and isn't this the truth: That the object we gentlemen were called upon to accomplish was to prevent the necessity for dredge boats and



to make a channel that would wash itself and carry the current until the lateral current of the Gulf would carry it away, will say that was a consummation devoutly to be wished, but we didn't expect it. I know Professor Haupt and know his scheme to accomplish that purpose, consisting of one pier instead of two.

As to whether it was a problem that we gentlemen were called upon to determine whether or not Professor Haupt's scheme of one wall, one jetty would fill the bill, or whether it would take two, will say the problem was simply, as I say, to prepare a plan for deepening the Southwest Pass of the Mississippi river. Incidentally Professor Haupt's plan was considered, but it was not considered feasible and it was not the plan which was formulated.

Being asked if it was our problem to build a stone wall into the Gulf of Mexico, out onto the sand bar, and by the aid of a dredge and the current afford a deep channel into the ocean, will say that is about it.

As to whether it consisted in carrying out cargoes of immense big stones, dumping them over and forming a wall of them, will say not very large; they were to be founded on mattresses and protected by piling. Really, I can't tell you because I had nothing to do with the execution of the work, but only on top would they use very large stones. On the top of such jetties it is desirable to use such stones as would have to be lifted by derricks. It was topped off with stones four or five feet square or more.

The part we had to do was to help plan this stone wall. As I understand, it is nearly finished. I can't speak advisedly, but I think they have to use a dredge in connection with the current.

The chairman of the commission was Colonel Robert, U. S. Engineer Corps, the other members were Major George M. Derby, Major Starling and myself.

I don't know of but one estimate to make the roadway at and deepen the Southwest Pass. There was one made a short time before the appointment of our commission, but I have no personal knowledge of others. I was associated with the establishing of the harbor at San Pedro. The truth is, there was a conflict of interests, between San Pedro and Santa Monica, as a harbor for Los Angeles. The board was appointed under an Act of Congress to go and determine which of the two places would make the better harbor. Approximately, the board consisted of Admiral Walker, a mem-

ber of the coast survey, and I think three civil engineers; George Morrison, Prof. Burr and Col. Morgan. Los Angeles is about 18 miles from the coast. These two points are about equal distance from Los Angeles. The Huntington interests were striving to establish Santa Monica as the harbor, and other interests were trying to establish San Pedro as  
3269 the proper place. I represented the owners of the Los Angeles Terminal Railway. There were questions of harbor engineering involved, the proper location of the break-water, the shelter it would afford, room for anchorage, the possibility of developing the inner harbor, which was present at San Pedro and not at Santa Monica.

3270 Being asked if the inner harbor was not already established at San Pedro and appropriations made and work done, and practically finished, will say in a small way, yes; but it admitted of a very large development. The problem was the establishment of a harbor refuge, and of commerce, two quite different things.

Being asked to take the coast line from Santa Monica and the angle incident to the coast line and comparing that with the angle of incidence to the coast lines at San Pedro, and if that wasn't the problem that this board had to decide  
3271 and did they not decide it on that proposition, I should say no, they decided it on a number of considerations, the considerations being the possibility of obtaining adequate shelter at two points for a harbor of refuge which depended upon a lot of questions of topography, of depth of water. The water was deeper at Santa Monica but there was no shelter. One feature was that the San Pedro harbor  
3272 had the least exposure. I think it is true that three several boards prior to this one, appointed by Congress, had each selected San Pedro. One feature was that the space for railroad tracks to get to Santa Monica was confined to a space on account of the mountains and that the Southern Pacific Railroad controlled that and other interests insisted upon going to San Pedro. Several hundred thousand dollars had been appropriated and expended in building the inner harbor at San Pedro before this commission was appointed.

As to whether the inner harbor at San Pedro was made by a strip of land at some little distance from the coast line, extending parallel with the coast line, forming a possibility of extending it five or six miles, will say it was the coast line, that is, within the inland there was swampy, marshy territory which could be very easily dredged and developed into a har-

bor of enormous extent. There was a small river there up which there was navigation. I did not know the depth of the water. I think there was approximately five feet, but it had already been deepened to 14. One of the important features was to consider which of the two places would afford the best shelter in case of storm. To constitute a harbor of refuge at Santa Monica it was very difficult to construct a breakwater which would afford adequate protection. At the time I speak of there was one pier built by the Southern Pacific, extending 2,000 feet at the end of which they got deep water. Near the shore it was much shallower. It was a very expensive pier and its further development was a very expensive operation. The prime point in the problem was first to try to obtain a harbor that should give adequate protection against the wind and waves, which would constitute it a safe harbor in rough weather. There was no sea wall at Santa Monica. The building of an adequate protection against the wind and waves at Santa Monica was a very serious matter. That was the controlling factor as far as a harbor of refuge was concerned. The building of such a breakwater at San Pedro was simply the extending of an existing point to make it adequate to the future needs of commerce. In the report made, Mr. Morgan dissented. The engineering projects consisted of building suitable works, breakwaters and dredging.

3276 In connection with the Kaw river at Kansas City the problem was to provide proper protection against the recurrence of such a flood as had happened on the river in 1904.

As to whether our prime object was to deepen the river in some way so that the flood water would pass off rapidly, 3277 will say, of course the bridges, or rather the piers of the bridges as a mere obstruction to the flow of water were considered.

In most cases the piers of the bridges were made of rock or cement. The Kaw river runs in earth embankments. It was a silt bank, where the banks formed of silt, and required protection, and part of the project was a recommendation for the protection of the banks by a plan of extended revetment. Revetment is a word meaning to clothe the banks, protecting it against the action of the waves. It has already been revetted and protection work put in, but of a very bad sort, most of which I recommended removed. Rippapping is one method of revetment. There was an arti-

ificial embankment made by dumping the refuse from the stock-yards. It was an embankment which did not need protection, the others did. There were no other artificial embankments, nothing except the natural banks of the river. I recommended revetment. There had been a good deal done in the way of protection work including some spur dikes. Spur dikes is a kind of stone built out from the banks of the river projecting into the river at right angles, usually to the banks of the river. I believe in upper river they are called wing dams. The point where they are used for the purposes of navigation is to contract the channel. They are also sometimes used as a means of bank protection. If they are built very close together they have the effect of creating a new bank, but in the case of the Kaw river it was clear that they were sources of obstruction and damage and of no value whatever, and I recommended the removal of all of them. The prime object was to provide a more efficient channel for the carriage of flood waters and incidentally to close the banks so as to prevent damage to adjacent industries.

3281 Q. If you build a spur dike or a wing dam from the shore into the river, the effect of that is to immediately narrow the channel, then why would you build a spur dam to cause a bigger and better channel?

A. There was not room enough. The spur dike occupied the space needed for water. My recommendation was to take them all down.

I have examined railroad bridges that cross the Mississippi and Missouri rivers. With a view of protecting the channel in part so that it shall always go under the bridges; also that it shall not flank the bridge and cut the railroad in two.

All the usual devices for protecting the banks of the river are used.

3283 The examination of these bridges crossing these two rivers was to protect the piers next to the land at each end of the bridge from being surrounded by water and destroying the bridge; that was one part of it. The railroads had to take care of the river bank for long distances up the river in order to protect the railroad, sometimes for miles or more away from the site of the bridge. One instance is at 3284 Rolo, that is a crossing of the Missouri river, thirty or forty miles south of St. Joe, on the Burlington Railroad. There is no trestle work but an embankment. It has been filled in for years, existing as a solid bank. In that case it

has been necessary to carry the revetment back three miles up the river.

Another point is Nebraska City. The problem is somewhat difficult, but the general feature is very much the same. There is no trestle work there excepting over the old channel some distance east of the present river. Mr. George S. Morrison built the bridges at the points mentioned years ago.

Plattsmouth is another instance of the same kind. That is the crossing of the Missouri River by one of the Burlington lines. In that case that would be necessary to extend the revetment for a long distance up the river. Mr. Morrison designed that bridge work originally and built the bridge, but the work of revetment building is a continuous work; must be continually renewed and extended, because the river is constantly threatening to get in behind at the upper end. The Government has done in some cases a good deal of it. I

don't know that they have done any of it at Plattsmouth. I am not familiar with its past history throughout, but as I understand it, all the existing revetment at Plattsmouth has been built by the Burlington Road.

Being asked if any of these matters that I have mentioned, either that counsel has asked me about, or that he has not asked me about that I participated in had a river on one side of the bank and a canal on the other, with a bank relatively a few feet between them, will say, no, sir; exactly that situation was not presented.

"Woerman Exhibit 3" presented and marked for identification.

#### *Redirect Examination.*

I have made an examination of the map (Woerman Exhibit 3) since I was on the stand last night. That is what is known as a contour map of a part of the canal and Desplaines river extending from the mouth of the Kankakee river, several miles upstream.

All the lines showing elevations are drawn out showing differences of level of one foot. They show the level of the towpath bank, the level of the base, and the level of the intervening space. I have examined the plat with reference to ascertaining the elevation of the towpath bank for the portion of the canal shown upon the map, and from that examination figured out the cost of riprapping that bank in such

a manner as to protect the bank when the pool shall have been raised. I got the elevation of the base of the embankment at intervals of 500 feet along the line of the canal from the mouth of the river to the road extending at Channahon, a distance of 20,000 feet. The base of the embankment, of course, the top level of the canal is an estimate as an elevation of 86 on the datum plane used upon this map. The 3290 top of the bank I estimate as 86 level, of course, as it goes, it is a level work. Then, the difference between the elevation of 86, and the series of elevations of the toe of the embankment, give the difference, and that is the slope of the bank to be protected. From those data I made an estimate on two suppositions, the first of which, that certain parts of the bank which are rather, their insufficiency is greatest, and where there is no protection from the vegetation, the trees, the underbrush, only should be protected a stretch of 2,000 feet from the mouth of the river, and another stretch of 3,500 feet at the point 6,000 feet above, and extending 3,500 feet. The cost of riprapping that figured out \$22,400. That is the part which I should say, practically the only part now, where revetment was essential; but I also made another estimate upon the supposition that the whole embankment was revetted for the entire 20,000, which figured \$50,000 in round numbers; that is, 20,000 feet or 3  $\frac{8}{10}$  miles. The revetment extends to the top of the bank. The top of the bank would vary at various places in this 20,000 feet; it varies from nothing to 20 feet vertical.

*Recross Examination.*

3293 Being asked if a dam is constructed at the proposed site it will flood the towpath bank on the river side, would say it will flow along the base of the bank and cover the base of the bank for a considerable part of the way, and for another considerable part of the way it won't flow against the base of the bank. The base of the bank

3294 is where it joins with the natural surface of the ground. I do not recall how high up along this towpath bank it will be flooded.

I understand that the ordinary level of the pool of the dam will be seven feet below the present elevation of the top of the towpath. The top of the towpath is now supposed to be in its present condition, 84 as I understand it.

Being asked how much it is up and down in feet, how high



that bank will be flowed up and down from the top where  
3295 the water would be alongside of that bank, will say that  
depends upon where it is. That elevation of the water  
is 7 from 84, is 77, as the normal stage of the water in the  
pool of the dam. Now, the base of the embankment, or the  
base of the natural surface of the ground, rather, at the base  
of the bank varies from 66—that is the least I find, (6, 70, 74,  
up to 84—in other words, the height of the bank varies from  
zero to 15 or 20 feet. It is zero where the surface of  
3296 ground is 86. In estimating these costs I took into  
account simply the cost of riprapping. The cost of  
widening this towpath bank nor for raising it is not taken  
into account, just riprapping on the outside. I did not get  
any information as to where this stone was to come from ex-  
cept that it comes by boat. I was told by the contractors what  
the cost of getting it was and based my figuring on that. The  
thickness of the riprapping was 12 inches. Riprapping  
3297 is not solid masonry; water will soak through it. I  
do not understand that an embankment of clay is sat-  
urated with water. The understanding is that it is imperme-  
able.

Q. If you dig a trench three feet wide and six or eight  
feet deep in blue clay and build a cement wall a foot thick  
on that, and a superstructure above it and leave the sides of  
your wall so that the water gets in there by the side of your  
cement wall, will it not saturate through the blue clay, go  
underneath your wall and be very liable to cause your wall to  
slip and fall?

3298 A. I should say no. I would say this: A very usual  
method of protecting a reservoir embankment against the  
action of water permeating the embankment and destroying  
it is to build what is known as a puddle wall or core, in the  
center of it. The puddle wall is built of clay for the purpose  
of arresting the flow of the water through the embankment.  
What they put in on the outside of the puddle wall depends  
on what material is at hand. If that is clay it may need  
no puddle wall; if it is sand or other material that is easily  
permeable with water, that water would be arrested by the  
puddle wall. The puddle wall is not protected with cement  
or anything of that character. It needs no protection.  
3299 I found a bench or wave berm, as stated yesterday, on  
the canal side of this towpath bank between three and  
four feet wide. I did not go much into the history of it,  
whether it was a matter of original construction or whether



it is the result of the action of the waves and the use of the canal, I should think very likely it was the action of the waves. If it was full up as it originally was, I should think it would be more stable than it was before. It was a gradual washing of the dirt from behind the wall which may have let it down. By behind the wall, I mean on the canal side. There

is a very considerable wave motion due to the motion  
3301 of the boats. On the other side where this pool will be formed and where the width would be anywhere from 600 to 800 feet, and where there is a considerable current  
3302 likewise coming down, the banks will need protection.

If there was a navigation such as could be had on 14 foot depth of water by boats of that magnitude, it would emphasize the need of protection. The effect on the river side if made up would be to saturate the outside of it a short distance in, perhaps a few inches. If it is wet in 3 inches I should say that the stone will not be liable to slip down and fall. The slope given was two feet horizontal to

3303 one vertical. I did not examine the specifications as to what the slope would be—I saw none with reference to the protection of this bank. I saw a cross section showing the revetment. I think it was Woerman Exhibit 1. That is the only thing I have seen, either of plans or specifications indicating the manner of protecting part of this work. In raising this towpath bank I understand it is left the same width as before, simply raised up a little higher. There  
3304 was a wall of stone built in the canal resting upon this berm or bench I mentioned; that would narrow the water in the canal probably two or three feet, that was in a very shallow water, not navigable water. From my observation it was about 18 inches to two feet above the level  
3305 of the water. I saw it sounded where it was about 18 inches; that was on the edge of the canal. This stone embankment is on the edge, presumably on that bench. I did not sound it right at the end of this stone bank. I don't know how far down into the prism of the canal this embankment went.

I do not know the price of labor employed down around the side of this place. I do not know what it would cost in labor to do this riprapping, because I have had no occasion to work in that particular locality. The stone  
3306 might be brought from anywhere on the canal. I don't  
3307 know where. The prices of riprapping do not vary very greatly. It is all about the same thing. You can get

stone all the way from fifty cents to one dollar a yard, almost any place in the United States, fifty cents is the minimum. I used a higher price in my estimate. I used three dollars a yard in places. By fifty cents, I mean raw material. The difference between one dollar and three dollars would be for the work and for the transportation. Fifty cents  
3308 would be a very low price and a dollar would be a medium price. I put the cost of riprapping at one dollar a square yard. That is equal to three dollars a cubic yard, which I think is more than it will probably cost. In this estimate I lumped the raw material and labor together; that was predicated upon my own experience as to the probability and the reasonableness of that price. I mixed those two. I used virtually my own judgment of what it ought to cost. Have had some experience in trying to hold the Missouri river bank. The standard estimate for complete revet-  
3309 ment of the Missouri river bank which includes a mattress going out underneath the water and the riprapping and the incidental work of placing, is about ten dollars per running foot. That, however, is a very much more serious thing than mere riprapping, and I would say that that is a full and high estimate. My figures were only for riprapping one side of the bank and I allowed nothing for any other cost or expenditure, save and alone the riprapping. I would say that the feeder where the old piers were standing was from 18 to 20 feet wide and probably 4 or 5 feet deep. The water can be siphoned from the river up into the canal. I have not figured out the size of the siphon it would take to run the water that would be carried in the feeder, but it would be entirely practicable to do. The usual method is laying  
3310 ing cast iron pipes, which may be probably 48-inch pipes. The pressure of the water behind it makes it go uphill. It is a very common process. Water flows through bends in the pipes. It is simply governed by the head of the water at the upper end. The full term is an inverted siphon. The velocity through the pipe would be very much greater than it was through the feeder. You would not need the same cross section in the pipe as in the feeder. The  
3312 velocity of the current through the siphon would depend upon the elevation of the water above the siphon, between the upper end and the lower end. The difference in levels between the place where it goes in and where it comes out.

3313 Q. You said that the velocity of water in the siphon would be very much greater than it was in the feeder. Therefore, you would not require so big a pipe as there was area in the feeder, and I am asking you if that is not dependent entirely upon the elevation of the water behind the siphon?

A. The force which produces motion through the siphon is the difference of level between the water at the entering end and the end at which it goes out. In the flow of water in the channel that difference would be very small, but by making the difference of level greater you can produce any velocity you desire.

3314 The whole point is this, that in a stream in motion, with no water entering it or leaving it, the amount of water passing at any cross section is the same. If you have a small cross section, as you may, the velocity necessary to pass that amount of water is greater. In a broad cross section it spreads out and has a very slow velocity, but passing always the same volume of water per second. Now, in the canal, or feeder, being a much wider canal, the velocity necessary to pass a given amount of water would be very much less than it is in the narrow reaches of the same canal, or the same feeder, but with pipes there would be no difficulty in getting into the feeder the required amount of water. The head necessary to produce that is something that is very easily ascertained.

3315 Q. There is no data present in your mind or in fact that enables you to know that the velocity of water in this feeder, when it was in operation, was the same as the velocity of water in the canal?

A. Well, I haven't any idea about it. The velocity in the feeder would never be very much more than the canal.

I should say that as a rule the difference was very small, and that in either case the velocity is very low.

As to how big a pipe it would take for a siphon to put this water across there, in my judgment, I will say I can't tell you without figuring. I don't think it would be very expensive.

3317 Q. You spoke of vegetation along the lines of this towpath, or between that and the river, and I think you estimated roughly that half of the distance was in a sense protected by vegetation in one form or another, is that right?

A. Yes, sir. There is some quite large trees, up to  
3318 12 inches in diameter. Really I cannot give you the estimate in figures. I saw quite a number of them. From Channahon down to this site of this dam, I went down on the towpath bank. There are trees on the slope of the bank itself, in some cases a foot through. I saw one stump on the edge of the bank that was pointed out to me and it measured three feet through; it was cut down and had  
3319 rotted. That was at the top of the bank. It looked as though it was grown there after the bank was built. I think the bank has been there approximately sixty or seventy years. From the situation of the tree, it looked as if it had grown there since that time. At some points the undergrowth of smaller trees are quite thick. At others they are sparse. It is brush up to saplings two inches in diameter up to  
3320 large trees. If it is flooded with water and below the level of constant water, it will disappear; where it is only occasionally flooded, it will not. Where it is below the level of constant flooding, the trees will die.

*Re-re-direct Examination.*

3321 Protection is needed below the level of constant flooding only as a basis of security for the support of that which is above.

The Southwest Pass of the Mississippi has not yet been opened. The width of the Southwest Pass is six hundred feet. The projected width of the Southwest Pass is a thousand feet. The depth in the South Pass is a maximum of 26 feet; the depth to be obtained in the South Pass, in the Southwest Pass is a minimum of 35 feet. In other words, the new channel will be 35 feet deep and nowhere less than 1,000 feet wide.

3322 The breaks in the Mill creek sewers at St. Louis did not occur in any work designed by me. A part of the sewer which was existing when I was in office, and which was in years before, gave way, and I designed plans for its renewal, which plans were carried out successfully. It has not broken down since. Mill creek was a natural stream. The whole of it was taken into a sewer and all the tributary drainage.

3323 In connecting with some railroad building, we diverted the Tuscarora river in Ohio, in building a dam across it and diverting it into a new channel. At times it was a

considerable stream. Its normal flow was about 100 to 225 feet wide.

The revetment of the Mississippi river is very different from the revetment of the Missouri river. The banks of the Mississippi are relatively stable. They are rocky, gravel banks which require very little protection. The cost of protecting and continuing the protection of the Mississippi river is very much less than of the Missouri river.

3324 I have had occasion to study the durability and resistance of different kinds of material for artificial river banks. I have in mind a long revetment or protection of the west bank of the Mississippi river at Quincy, which is exceedingly permanent. I think it is of very simple riprapping. There is no especial care, no mattress work. The material of that bank is of a gravelly nature. I think there would be no difficulty upon the hypothesis that the pool should be raised and that there should be 14 feet of navigation in that pool, in protecting this bank. The wash of the waves is greater in a narrow channel, due to the motion of the boats. It is a proper interpretation of my answer to say that the wave wash would be less effective on the outside of this bank if the pool were placed there, than the wash from the boats in the canal. In my opinion the manner of protection indicated on Woerman Exhibit 1 is adequate.

Regarding the filling in on the inside of the canal, all that I saw and all that I learned indicated that the slope of the part added was substantially a continuation of the slope below. By a conference with the contractor, I ascertained what the prices were for doing this work of protection. The cheapest labor does this kind of work generally.

*Re-re-cross Examination.*

3327 When I said that the wash on the outside of this bank would be less than the wash in the inside, I meant that with the same navigation, a given boat on the inside, with its narrow width of canal, would wash more than the same boat on the outside in a greater width. The width of the channel is really the greatest factor in the production of waves.

3328 Q. Suppose you have a pool of water from 600 to 800 feet wide on the river side of this canal, of a depth sufficient for steamboats to ply up and down, drawing 10 or 12 feet of water, and carrying 1,500 or

more tons of freight, and that they go at from 6 to 12 miles an hour. On the other a canal 60 feet wide of water with canal boats, drawn by mules on the towpath and traveling at the rate of from two to two and a half miles per hour; which would get the bigger wash?

A. I should think there should not be very much difference under those conditions.

3329 ELMORE W. BEWLEY, called on behalf of the defendants, testified:

*Direct Examination.*

My name is Elmore W. Bewley. I am a captain, 58 years old. I reside at Bowling Green, Kentucky. I have been steamboating 40 years, began when 18 years old. I have steamboated on the Ohio, Barren, Rough, Nolin and Cumberland rivers. I have a master's and pilot's certificate. Have been a licensed pilot for about thirty years. Have navigated sternwheel boats principally. Navigated on the Ohio  
3330 and Green rivers about eight years, Ohio alone four years. Green river all told about 36 years. Trip about 200 miles long. The Barren river we navigated between Evansville and Bowling Green. I steamboated up the Rough river about 8 months (80 miles). Was on the Nolin river about six months; 14 miles navigable. On the Cumberland river, six months. Up to Nashville, 200 miles from the mouth. I have owned or had interest in the following steamboats: The Gayosa, Evansville, Bowling Green, City of Clarsville, Sun and Rescue. My constant occupation has been that of a steamboat man. I am still engaged in that business. Am running up the Kentucky river next Thursday on a sternwheel boat. I saw the Desplaines river on the 28th  
3332 of April, 1908. Went from Joliet down to the mouth. The Desplaines river, according to my judgment, as I saw it, is not a navigable stream for useful purposes of commerce, on account of the swift current and the rocky shoals. I saw it at several different places, I would not say just how many. We went down the river from Joliet to the mouth.  
3333 We crossed the river six or seven times on the different bridges and down the banks; where we could see the river most of the way down.

The Ohio river has a navigable stage in extremely low water, we navigated there on as little as 24 inches. Not without a great deal of trouble, however. It has not occurred in the last four years. Up to four years ago, it was most every year, in the fall of the year in extreme low water. It would continue from two to three months. We would find that depth at different sandbars, not the same depth at all the bars. Only at sandbars would we find the shoal water.

3334 The Desplaines river has a rocky bed in some places.

Most of the bed of the Ohio river is mud and sand. There is a difference in the navigability of a river with a mud or sandbed at a low stage of water, and the navigability of a stream with a rocky bed at a similar stage of water. It is more difficult to navigate a river with a rocky bed, from the fact that you must have more water on the rocks than the steamboat draws; in the Ohio river where you have sand you can run up on the sand and spar the boat over after several hours' work. You cannot do this on a rocky bedded river because you cannot move the rocks and the sand you can move by spars. There would be a difference in the hazard to the boat in attempting to spar over a rocky shallow and a sandy shallow. You are liable in sparring over rocky shoals to injure the steamboat.

3335 I have done but very little cordelling. I observed the velocity of the Desplaines river and its slopes, and the curves and bends of the banks. Those matters enter into my opinion as to its not being a navigable stream. It is more difficult to navigate a crooked stream in a swift current than it is a straight.

Q. Assuming that a river began at a point of the river 20 miles from its mouth, assuming that there is a fall of 38 feet in the first  $4\frac{1}{2}$  miles or  $8\frac{1}{2}$  feet per mile; that in the next stretch there is a fall of 21 feet in  $3\frac{1}{2}$  miles, with maximum slopes of more than ten feet per mile, containing islands and boulders, some visible and some submerged, with rocky bottom; then next following in the descent of the river there is a pool 5 miles long with no fall, and next following that 94 feet a fall in one mile, 9.4 fall in one mile, with maximum slopes of more than 15 feet per mile; as narrow as 100 feet, and having abrupt turns and boulders in the channel; and next following that descending stream a pool one mile long with practically no fall, and next following that a fall of 2.7 feet in one



mile, with maximum slope of about 4 feet per mile, with a rock bottom and boulders; and next following that a fall of 2 feet in  $3\frac{1}{2}$  miles, and rapids at the mouth, a fall of 3 feet in a half a mile, with a rocky bottom,—would you say that a river of that description could be navigated by a boat for useful purposes of commerce?

A. Those being the conditions, I do not think it could be navigated.

I would say a river which in  $15\frac{1}{2}$  miles had a fall of 38 feet, all of which occurred in stretches aggregating  $6\frac{1}{2}$  miles could not be navigated.

*Cross-Examination.*

3337 Most of my steamboating has been on the Green and Barren rivers. The Green river is in Kentucky. The portion navigated was 230 miles, Green river proper. Running from a point 9 miles above Evansville, Indiana, to the Mammoth Cave, that would be the Green river proper. Barren river is 200 miles from Evansville. Our regular trade is between Evansville, Indiana, and Bowling Green, Kentucky. We navigated the Ohio river in that trade nine miles, the Green river 170, Barren river 30, making a 209-mile trip from Evansville to Bowling Green. Mammoth  
3338 Cave is the head of navigation on the Green river. At the head of navigation it is about 120 feet wide. In low water there is about four feet of water. Green river is locked and dammed. After building Lock No. 6, the first lock below Mammoth Cave gives them four feet of water on  
3339 the bar at Mammoth Cave. It is 122 miles on the Green river from where you enter it just at its mouth, up to Mammoth Cave landing. In that district there are six locks and dams; they are not regular. The first pool is 60 miles, the next two, 45, the next is about 20, the next is 13, the next is about 17 or 18 miles. That is the head of navigation. The height of lock to hold the first pool of 60 miles is 14  
3340 feet; for the second pool, 45 miles, about the same; the next one, I think, is 17 feet approximately; the fourth one, 14 feet; the fifth one is 13 feet, and the sixth one, 11 feet. These locks bank up the water about 221 miles.  
3342 I never navigated the river before these locks and dams were put in. The water from each of these dams back water clear up to the dam above it. I don't know how much water is added by each one of these dams at the point in

the river just below the other dam. The river has a mud bottom, the principal part of it. In some places it has a rocky bottom. There is plenty of water over all the rock shoals. There is no navigation in Green river above Mammoth Cave at any time. After you get above Mammoth Cave landing, you have a deep pool again. Slack water does not extend some distance up the river from there. I do not know how deep the water is in shoal places above there. I do not know how deep the water would be in Green river, if it were not for the dams. The current is greatly reduced in this river by virtue of the dam. In times of high water it would be pretty rapid if it were not for the dams. As I understand it, the object of the dam is to give depth of water.

3344 The navigable length of the Barren river is 30 miles.

There is one lock and dam on that river fifteen miles from the mouth. I do not know how deep the river is above slack water. I suppose the average width would be about 100 feet. Where it is navigable it is from 100 to 250 feet. In some places that in the slack water above the dam, we have

3345 shoal places that in low water season is about five feet, four and a half to five feet. I think the dam is about 15 feet deep. The river is about the same depth below the dam. We have what we call there in low water season four and a half feet. The bottom of the river is gravel mostly. The boat we navigated was 120 feet long, 25 to 30 feet across, with a carrying capacity of 200 tons. The same size boat that was used on the Green river on account of the locks.

200 tons of freight can be carried as far as Mammoth  
3346 Cave on the Green river. We had four feet in the shallowest place, at Mammoth Cave landing in the Green river.

I navigated the Cumberland river. The Nowlin river is about 15 miles below the Mammoth Cave, it is a branch of the Green river. It is navigable 14 miles up, to Dismal Rock. The water from the dam in Green river below the mouth of this river holds the water up in this river. It was not navigable without that. I suppose that river runs from 75  
3347 to 90 feet in width. It holds its depth pretty well all the way up. I suppose there is at least six feet of water all the way up at the shoal places. Some places it is very deep. In the locks there is four and a half feet of water in the miter-sill.

3348 Rough river is a tributary of the Green river and is navigable thirty miles. It is about 90 feet in width.

We have four feet depth of water in Rough river on the miter-sill. They have one lock on that river, eight miles above its mouth. It was not navigable before the locks were put into the Green river and Rough river except in high stage of water. Green river was not navigable before this improvement. I suppose it would be, taking it all together, two or three months in the year. Before these locks were put in, boats sometimes went up there in very high water. I can't say for how long a period it was navigable yearly. Nolin river was not navigable. It was not safe to navigate that in high water. As to the Barren river, I am not sure as to that. In case of very high water you could possibly go up there, but you could not call it safe navigation from the fact that the river was narrow and the overhanging timber—

I never cordelled a boat anywhere myself. By sparring is meant: We have on a steamboat what you call a steam capstan out on the head of the boat, and we run our boat down on the sandbar, and then we have big spars, great long timbers and we set the spar over on the side of the boat and put our line on the capstan, and we have a pair of blocks, and the spars canter this way (indicating) and go forward or around. You can get your spar to shove the boat forward or set your spar to shove the boat around as you may want. This process is used when you get into shoal places, get stuck on the bar. The process consists of making a fixed point with the spar, attaching that to the capstan and then by means of steam on the boat, turn the capstan and push the boat on up by its own power.

I navigated the Cumberland river from its mouth to Nashville, 200 miles. The boat used was about 160 feet long and about 30 to 32 feet beam, tonnage 350 tons. When I was running on the Cumberland, that was before the improvement was made on the harbor shoals and the water got down to 24 inches there at one time. We made only one trip on that water and she was not carrying that much load. The name of the boat was J. B. Richardson. The year, I think, was 1904. The Government was at work on the river at that time. This boat does not go above Nashville. At Nashville we met boats that navigated above here. They were about the same size and some of them carried about the same tonnage. I don't know how far they went up the river. I never navigated above Nashville. I don't know the depth of the water. I don't think it is as

deep there as where I navigated. Where we navigated on the 24 inches of water we did not have a pound of freight. We were going down stream. We did not bring out anything over the shoals. We had lighters and used lighters over the shoals. What we call lighters are barges that we have in tow, and when we get to the shoal place where there is not enough water for the boat to go over with the freight she has got, we move it from the steamboat onto the 3355 barge, all of it, or as much as is necessary to let the boat over, take the freight over on the barges, and the steamboat over light. We have not done this frequently because it has been very seldom necessary. My principal work was done on the Green river in slack water navigation. I have navigated the Ohio river between Evansville and Cairo and Paducah, at times. I navigated that river down to about two feet of water; that was about four years ago. That has not occurred during the last four years, but prior to 3356 that it occurred nearly every year. From Cairo, Illinois, to Evansville, Indiana, is about 200 miles. I have been up as far as Louisville, Kentucky. Have not found the water lower than two feet. Small boats from 60 to 175 feet long were used on that minimum depth, about 30 feet 3357 beam. Over two feet of water you could not carry over 75 tons on a steamboat. Some boats, if you built them in proper shape, would probably carry a little more; it depends on the depth and breadth and the machinery that you have. I know some boats that navigate on that part of the Ohio river—I know nothing much about the upper branches of the upper part of the river. From my standpoint about 2 feet is the minimum depth. The boats I have in mind carry from 150 to 300 tons when loaded. The Government has been doing considerable work on the Ohio river. There has been no dredging done where I have navigated. I know there is work being done on the river by the Government. I 3359 know there is such a thing as the Ohio River Improvement Association and their business is to solicit the general government to improve the Ohio river in various forms. I think they are succeeding in getting some work done.

I went down the Desplaines river on April 28, 1908. Went down in an automobile and crossed the river six or seven times on bridges. I think we must have found six 3361 bridges. Mr. J. W. Woerman was with me and Captain McBride of Louisville. We went down to the mouth of

the river, a place where they had a cofferdam. We did not go down the towpath bank a part of the way, nor through the Village of Channahon. We were on the left bank when we reached the site of the dam, did not cross the river at that point. Was not over where the work has been done by the defendant company. Was not on the river at any time in a boat during that trip. We got out of the automobile opposite the dam and walked down through the fields, I suppose a mile to a mile and a half I suppose that was about a quarter of a mile from the river. We looked at it the best we could, could see the river plainly there.

Q. Your highway that you travelled, came down half a mile or more away from the river and you got out opposite to the point of the river that you went to where the dam is, and you walked across from the river to the highway, is that it?

A. Walked down through the field, yes sir. Stayed on the bank opposite I suppose thirty minutes. Left Joliet at one o'clock and got back there about half past six. Traveled 15 to 18 miles. That is the examination I made of it. At some places the road was half a mile away from the river, at other places not so far. I suppose about half the distance is within a half mile from where we were going along the road.

3365 *Re-direct Examination.*

I think the locks in Green river were completed in 1835. The improvement was made at the same time on the Barren river. We could see the cofferdam on the Desplaines river from the point where we were on the left bank. We were at the aqueduct. We were right down the river bank at the aqueduct. I cannot recall all the bridges we crossed. Jackson street was one, I think, Cass street, Rock Island bridge. I think there is a bridge at the place they call it Brandon's road; that we crossed. At Treat's Island we crossed over on a bridge and came back to the right bank again and there is a bridge below that, Smith's bridge, and the McDonough, that makes seven.

3367 Q. All of them in Joliet, aren't they?

A. It is right hand to remember all of them.

3368 We stopped the automobile on these bridges and viewed the river from these bridges. I don't think we

got out. The Jackson street bridge we did not cross in the automobile; we walked across that bridge, and then returned back to the left bank and walked down to the next bridge and got into the automobile down at the next bridge.

COUNSEL FOR DEFENDANT. Q. Did you ever know of steam boats navigating on such slopes and declivities as the maximum slope and declivity that I stated in my question this morning?

A. Not to my knowledge.

*Re-cross Examination.*

Q. You don't know whether some of the boats that you have known have undertaken slopes of that depth or not?

A. I could not say what steamboats have done in some other parts of the country, no steamboats that I have known of or heard of.

My navigation has been mostly on slack water. That is easy navigation.

NATHAN P. PRYOR, called on behalf of defendant, testified:

*Direct Examination.*

3369 My name is Nathan P. Pryor. I am forty-two years old and live at Carrollton, Kentucky. My occupation is that of steamboat pilot and master. Have been engaged in the steamboat business about 28 years. Have held a commission as pilot 13 years as master 11 years. Have navigated steamboats as master or pilot on the Kentucky and Ohio rivers between Cincinnati, Ohio, and Evansville, Indiana, on the Ohio river, and the mouth of the Kentucky river to Irvine, Kentucky, a distance of 271 miles. Have navigated all kinds of boats, propellers and sternwheel boats, and side wheel boats and gasoline boats from 30 feet to 300. Have had about a year's experience with gasoline boats. They were small flatbottomed scowbowed sternwheel boats, about 70 feet long by 18; were freight carriers. Have navigated 3371 gated boats of this description between Madison, Indiana, and Monterey, Kentucky, that is 12 miles on the Ohio and 40 on the Kentucky river, in the past year.

Saw Desplaines river on the 17th of this month, between Joliet and the mouth.

Q. In your judgment, and based upon your observation that day, state whether in your opinion the Desplaines river between the points where you saw it is a navigable stream?

A. I saw a very rapid stream obstructed a great deal by bridge piers, islands, and timber and some rock shores, and there were rapids in the river and it would appear to me from my river experience that there were obstructions there. At the time that I saw it it was a high stage of water, and I could not tell what these obstructions were, but there was obstructions of some kind in the river at all these rapid places, that from the indications of the rocks and shores, I would judge there was rock in the middle of the river.

I saw it at its mouth where a dam was being built, at Treat's Island and at Brandon's road. We could not get to Smith's bridge on account of the water.

3373 Q. From your examination of the river, state whether or not in your opinion it is a navigable stream?

3374 A. I don't think it is. It was too swift to navigate a boat of any kind on from the fact that if you were going down stream and had a stop to make anywhere, I am sure it would be impossible to land your boat anywhere. Coming up stream there is no boat within my experience that would stem it. The kind of gasoline boats that I have had any experience with would not start in it. The current is so swift they could not get in the mouth of it. A gasoline boat is not adapted to the navigation of a rapid stream. You cannot put the power on. You put power enough on it to navigate a rapid stream, why then you get too heavy  
3375 a draft boat, and they do not develop the power that steam does; they are liable to break down at any time.

In case of a break down with a gasoline boat in a current of that kind, you are at the mercy of the current; you have got no control of your boat in such a current as that and if you meet any obstruction of any kind, you would knock a hole in the boat. Gasoline is not a reliable power in the operation of boats, not by any means.

Q. Assuming a stream of the following description: begin at a point twenty miles from its mouth, we find a fall of 38 feet in four and a half miles, considerably more than eight feet per mile; the next stretch of three and a half miles, with a fall of 21 feet, with a maximum slope of more than ten feet per mile; then next following a pool five miles long with



no fall; then next following that pool a stretch one mile in length with a fall of 9.4 feet and maximum slopes of more than 15 feet per mile; then next following a pool one mile long with practically no fall; and next following that pool a stretch of one mile with a fall of 2.7 feet with a maximum slope of about four feet per mile; then next following a fall of two feet in three and a half miles, and then a fall of three feet in a half a mile at the mouth, the bed of the stream being rock; what would you say as to whether or not a stream of that description is navigable.

3376 A. I would not consider it a navigable stream.

At various places in that stretch of the river I should say it was impossible to navigate on account of boulders, rocks and islands.

Q. Could you navigate a stream which has a fall of 38 feet in fifteen and a half miles, which fall is comprised in a stretch aggregating approximately six and one-half to seven miles of the whole fifteen and a half miles?

3378 A. I don't think you could navigate it with any kind of a boat. I observed the curves and bends in the river. In a crooked river you of course have to make very abrupt turns to get around these bends, and your boat naturally takes what we term a flank; you have to hold close up to the points, and in doing so that current is so strong that the stern of your boat will overtake the head, and turn around, and the first thing you know you are turned around going up stream instead of down.

3379 I would not consider it safe at all to navigate where there are abrupt curves coupled with a narrow channel, 100 feet in width and a swift water and rock bottom, the fall at such point being 9.4 feet in one mile and a slope of more than fifteen feet per mile. Have never known of anyone navigating a slope of 15 feet per mile. I have warped boats. Don't believe I could take a boat up the river at Treat's Island by warping.

3379

*Cross-Examination.*

I began the steamboat business when a boy fourteen years old. Since I have been a pilot I have been on Kentucky and Ohio rivers, before that I was on the Mississippi river some. The Kentucky river has been improved by the Government. I navigated 210 miles instead of 271 miles. That takes it from its mouth to the head of slack water navi-

3381

gation at Irvine, Kentucky. There are eleven locks and dams up there in 210 miles. The two that are farthest apart are 26 miles. The two closest together, twelve miles. The water is backed up from one dam clear up to the other. It was navigable in a way before this improvement. As far back as I can remember when I first started at the age of about 14 years, the locks and dams were broken out. They were originally built by the State, and the Government took charge of the river in 1880, repaired these old dams, and built some new locks and dams, and when I first started, we went through the breaks in these dams, and in the summer when the river would get low, the boats would have to lay up and quit. Whether it was navigable before the State put these dams in or not, I could not say. Prior to the time the general government fixed it and after the breaks occurred in the original dams, they were navigable with a small boat towing a barge perhaps six months in the year. It got down to a stage where there was not over 18 inches of water on the shoal places. The boat quit on about two feet. Had one barge to carry freight on, the boat itself was too heavy. She was about 75 feet long and 18 feet wide. She would not carry over 30 or 40 tons. Her only means of carrying freight was by a tow on a barge. Tobacco was the principal freight. The barge would carry 40 or 50 tons outside of the cask, which would be some five or six tons more. Have navigated the Ohio from Cincinnati to Evansville, about 350 miles. All classes of boats from a small boat to a long boat of 300 feet. The 300-foot boat would carry 1,200 tons. From that they have them down to pleasure boats, which do not register any tonnage. The smallest boat that I have ever seen navigated there would possibly carry 60 or 70 tons. They are about 110 feet long, 20 feet wide. When fully loaded they draw about three and a half feet, with about sixty or seventy tons. When half loaded they could not go in less than two feet. They don't operate those boats at times over shoals to that extent with less than two feet of water. I never saw a boat operated on 16 or 18 inches of water, loaded or unloaded. I never heard of it. You cannot operate a boat 110 to 120 feet long, loaded, on 18 inches of water. I never saw it done. Don't think it can be. They would draw light 18 inches or more. Loaded with 60 or 70 tons, about three or three and a half feet. Half loaded, something over two feet. About thirty inches, perhaps not quite so much. The Kentucky river has no navigable branches.

The Kentucky river is the only side stream of the Ohio that I have ever navigated. There are times of the year when it is much beyond a slack water navigation. One dam backs water to the other one, that is what is meant by slack water navigation. That is true all the way up the Kentucky only at certain seasons. When the water is not very low it 3388 will give you a current from the mouth. There are times of the year when there is no slack water in the Kentucky river at all, a good portion of the year. I mean that the dams are entirely covered and we very often run right over the top of them. The dams are from twelve to twenty feet high, the lowest twelve, the highest twenty. The water would be practically level on top of the dam. There is often water enough on top of the dam that a boat goes over it, but it is too swift, you could not push her. You go through the lock on those conditions. We occasionally run over the top of the dam. If we find for instance, a boat draw- 3389 ing four feet of water and there is five feet on top of the dam and it is practically level, we go over it. We come down stream over those dams very often when we cannot go up stream because the current is too swift. Sometimes there is a fall at the dam, sometimes not. For instance, we take Number One Dam, which is four miles above the mouth of the river, and it is very often there isn't but six inches of water on top of that dam and it is backed up 3390 from the Ohio. Of course, that is slack water and they can go over without any trouble. If we had water enough to furnish a full level, we would go, but sometimes the river rises or falls, and there are greater falls at one time than there is at another. For instance, the water falls two feet below the dam, while it falls one foot above it, and it raises the same way.

When the water is very high in the Kentucky river and you start your boat up at the upper end of navigation and go right down over the dam, there would be enough water so that 3391 there is no fall. The number of feet is uncertain. One can easily go over a dam when he has a foot fall. You might have four or five feet on top of the dam. It is not any risk to go over a drop of a foot, and it is not an abrupt fall of one foot. It is a fall of a foot perhaps in 100 to 400 feet. I have gone down when it was a considerable fall down stream but not up stream. I absolutely never put my boat over a dam when the fall was anywhere from one to three in the length of the boat. I cannot say whether I have gone over

where the fall was two feet in four hundred feet. We don't take any gauge of the boat at all, only that we know there is water enough on top of the dam to float the boat. I won't deny that I have gone down there when the fall was two feet in four hundred.

3393 I was down to see the Desplaines river on the 17th of this month, at the instance of the defendant, for the express purpose of examining it and being a witness.

3394 My home is at Carrollton, Kentucky. I went by rail to Joliet and from there by automobile. J. W. Woerman was with me and the man who operated the machine. We went down the right hand side of the river all the way down. We crossed a number of bridges, but came back. I

don't remember being at Channahon. We were at the 3395 site of the proposed dam. We were on the side of the river next to the canal, the right hand shore. We went

from a point near the mouth up to Mr. Woerman's office. Never went as far as a mile on the towpath. We walked about a mile from where we left our machine to get down there. We were not along the bank at that time. We crossed about eight different bridges. In Joliet, there was Jackson street, Cass street, Jefferson street and I believe there was the Burlington Railroad. I would not remember whether Brandon's road is on a bridge or not. Then we went to the bridge below Treat's Island. Then we started to see Smith's bridge but did not get to it on account of the water.

3396 I saw enough of the river to have an intelligent understanding of it. The depth of the river I know from what they told me and my own judgment. I had never seen it. Of course, I had to take the other man's word for it. I cannot say positively how rapid the currents are. I was told the fall per mile but not the current. I don't know that I could in a scientific way compute the current or the rate of current from the fall of the river. I don't know how often I have heard the

3399 names of the streets I mentioned in Joliet. I talked pretty freely with Mr. Woerman all the way down and back. I was present in the room when the last witness, Captain Bewley, was being examined. The gasoline boats I mentioned ran from Madison, Indiana, to Monterey, Kentucky, 12 miles on the Ohio and 40 miles on the Kentucky. They carried about 15 or 20 tons. One of them is 65 feet long, 16 feet wide,  $4\frac{1}{2}$  feet deep; the other 70 feet long, 18 feet wide and  $3\frac{1}{2}$  feet deep. That is the depth of the hold

of the boat. A boat 70 feet long, by 18 feet wide, possibly could navigate on about two feet of water. The other boat would draw more water. They would carry about the same tonnage. I operated these boats at different times about a year. They ran both in the winter and summer, as regular freight carriers. They carried tobacco, poultry and eggs and wheat and passengers, miscellaneous freight.

I understand what is meant by cordelling. I never did any cordelling. The other name you apply to a boat when you push it over is warping, that is, sparring. I have used that method. That is where you ground in shallow water. Sometimes you lift the boat up and sometimes you push it over. If you want to lift, you ought to have two spars, one on either side, and set those spars straight in the water, resting on the bottom of the river on each side of the 3402 boat, and have a block and tackle from the top of the spar that runs down through a block on the deck of your boat, and take this line around the capstan, and you lift the head of your boat up off the bottom, and then to move it they will take a yawl or lifeboat and run ashore and make a line fast and take it around the capstan and trip those spars. That makes the boat jump ahead. All large boats that operate on the Kentucky and Ohio rivers carry spars ready for this kind of emergency. The gasoline boats do not. I never knew one to need them. The gasoline boats are sternwheel. I understand what is meant by warping a boat. I have had to do that in my work. I never warped a steamboat or gasoline boat. I have warped a 3403 barge. To warp a barge, you put a line out to the shore, to a tree or anything that will hold, and then you bring your line back to your boat and run it through a block or pulley of some kind, and on to a line that runs fore and aft on your boat from a given point, a point ahead of the boat to the point forward of the stern. Attach a line to that and take it to a windlass and pull up by it. Sometimes they do away with the sideline and push over with poles. Whenever we have a steamboat and a barge together we never warp. It is only when we have a barge alone. There is no power. Warping is nothing but an ordinary line that you carry all the time, and you can rig up a windlass by hand. The towboats never have to warp. When the river gets down to that stage, all the towboats quit. 3404 It is very seldom that towboats quit on the Kentucky river and on the Ohio it is irregular. They have been

running pretty steadily for the past four years. They have simply had more water. Up to four years ago, the towboats and their fleets would have to lie up and wait for weeks at a time before they could take them down the river. They generally waited about Pittsburgh or at points below there. They arranged their work so that they could get their boats all back to that point before the low water comes. Sometimes it is months. They use a few gasoline boats around Madison, Indiana, for towing light barges. They do not push much. On those light barges they carry wheat and posts.

3405

*Re-direct Examination.*

When I say do I not know the current of the Desplaines river, I mean that I do not know the velocity of it, how many miles it runs. I observed the current of the river from quite a distance along the road. On a rock bottom stream, they never sparred boats as I mentioned. They sometimes push them over one way or other, where they know the bottom is level. I have not seen gasoline boats used for commercial purposes smaller than those mentioned.

3406 THOMAS AUSTIN MILLS, called as a witness for defendant, testified:

My name is Thomas Austin Mills. I live in Will County, Illinois, have lived there 57 years. Born there in 1850. Have lived those years in Township of Channahon, right east of Treat's Island, about 20 rods from the Desplaines river. I think my father came there in 1848 or 1849. He owned and cultivated some farm land there. Treat's Island was a part of the property that my father owned at the time I was born. I think my father died June, 1853. My uncle operated the farm after that. I am a farmer. I farmed the same land my father did at Treat's Island. A few weeks ago I sold the island. I owned it ever since my father died and it has been cultivated all that time. Raised wheat and corn. There is about 74 acres in the island, 65 of it belonged to me, and it is about a mile long. I remember at one time of there being a dam and a mill on Treat's Island. The mill was running quite a number of years, when I was a boy. It was just below where the road is now; it was on the island. On the east channel



of the river. The dam was near the upper end of the  
3490 island. On the west channel the dam was a little further  
down. The dam was about 80 rods above the mill on  
the east channel. (Witness indicates on map (Zarley Ex-  
hibit 1, see Appendix, page ..... ) the location of dam  
at the head of island.) The left hand channel going  
down stream is the east channel. The dam across  
the west channel was from Treat's Island, about where  
the mill race crosses Treat's Island. I am living there  
3411 still. I am cultivating the farm not on the east side of  
the river but back from the river. The mill was right  
at the point where the mill race empties into the east channel  
and the dam was about 80 rods above that. I recall the dams  
and the mill ever since I can remember anything. It was a  
saw mill and it was in operation when I was a boy. The  
3412 dam across the east channel did not effectively block the  
stream at that point. I think the mill was operated up  
to just before the war, about '58 or '59. The dams remained  
there for quite a long while thereafter, probably three or four  
years. The mill ceased because there was not any more tim-  
ber for sawing. They got timber from the country round  
about there. In 1871 when the Deep Cut was made connect-  
ing the river with Lake Michigan, the water was low most  
of the time in the spring of the year. We most always had  
a freshet. We had high water in the spring and very low  
water all winter. The freshets would not last a month  
3414 or so. After them the river kept going down gradually.  
If it was a dry summer there would not be much water  
in it the latter part of the summer. There were places where  
there would not be over three or four inches of water. On  
either side of the channel, I have walked across there many  
a time without getting my feet wet, stepping from one stone  
to another. We never had any freshets to interfere with put-  
ting in the crop, and we generally had our corn planted in  
May. The high water season was here then. From that time  
there was very little water in the river. Sometimes there  
would be a heavy rain in the summer that would raise  
3415 it and it would go down again in a few days. With the  
exception of these occasional freshets lasting for a few  
days, the general condition of the water during the entire sum-  
mer season was that there was about five or six inches of  
water. The river had a fence across it, just above the mill  
race, on the east channel, as long as I can remember, up until  
about 1871 and we got high water there and they did not build



the fence any more. It was usually a post and rail fence. I maintained it prior to 1871. The fence would remain there from spring until spring, unless we had high water. Generally when the ice went out in the spring it would take the fence with it, and then we would build it up again after the water went down. It had to be renewed every spring after high water and it would remain until the next spring, unless we had high water. I have built it a good many times.

3417 The bed of the stream is rocky. There are boulders in it, granite boulders, four or five feet across. Quite a number not as large as that, but there are very numerous smaller ones. There were boulders all the way up from the upper end of the island down to the lower end of the island. They were here and there, scattered along all through the channel, on both sides of the island. They would be exposed six or eight months in the year. There were not so very many large ones, but the ordinary size boulder as large as a foot or two in diameter. There were plenty of those. I have

walked across the stream a good many times and stepped  
3419 from one boulder to another and did not get my feet wet.

I could do that in the winter time and in the summer time.

The cattle did not cross over the island, we had a fence around the island. They could get across anywhere. I think the first bridge was built over to the island in 1894. Before that, we had to ford it. We drove right across with teams and farm implements. Sometimes the water would be a foot or two deep and sometimes not so deep as that. I have seen

the water on the riffles on a place there where it was not  
3420 over four or five inches in depth. The riffles are where

it is scooping out, and then it would be high and the water runs over there and below that there would be a big pool. There were pools and riffles all the way down the length of the island. I do not believe there was a month of the year that some of the boulders would not be exposed.

A good deal of the time you could get up and over the riffles on Treat's Island with a skiff but you would have to get out and pull the boat over the riffles. What I call the riffles are little places where the stones are washed up and the water is shallow and below that there would be a little deeper water, but you would have to pull your boat up there for a long ways. I have had to pull boats up there where I had to pull,—about ten or twelve rods at a time. Then there would be a pool 60 or 100 rods long, in the east channel. Below that

there was another stretch of riffles; I don't know how  
3422 long, about 20 or 30 rods. I used to get out and wade  
and pull the boat over. The west channel is about the  
same, only there are not as many of these riffles as in the east  
channel. The riffles extended just a little way below the  
island. When the water was deep you could take a skiff up  
there; that would be in the spring of the year. Some-  
3423 times in the summer after we happened to have a heavy  
rain in the spring, you could float a boat without drag-  
ging it, for about a month or so. It would begin generally in  
March and April. That would be the only time in the year  
unless it rained. When we had summer freshets, it  
3424 would last a week or so. I have used the river with a  
rowboat, since 1871. I have not been up or down over  
the riffles on Treat's Island since 1871. The current is too  
rapid there now. It has been so rapid that you could not  
navigate a rowboat since 1900. The current has been swifter  
because the Sanitary District has turned more water in there.  
A rowboat has been taken up through either of these chan-  
nels, but I never did it. I don't want to try it. Comparing  
the condition of the stream with the condition before 1871, we  
would consider it a flood right now. We very seldom got  
headwater as high as it is now. We called it high water.  
3425 The banks were not flooded. If the water was as high  
now as it used to be, we considered it high water. Of  
course, once in a while it would get up on the land on the  
island. I never saw the island covered with water but once  
and that was prior to 1871; it was in 1865.

The effect of opening of the Deep Cut in 1871 was that  
there was very much more water coming through and it had  
the effect of covering the lower land and washing out the  
channel. The channel was considerably wider than it was.  
The current was more rapid. After 1871 up to 1900 the cur-  
rent was not as rapid in the summer time. In the spring of  
the year it would be, but in the summer time there was grass  
that grew up in the bed of the river and sort of dammed the  
water back, and it did not flow as rapidly, but when the chan-  
nel was cleared it was pretty rapid.

3426 My house was about 20 rods from the river. I could  
see the river every time I was outside the house. I  
crossed it almost every day, two or three times. We had our  
crops over there. We had to farm them and get them out  
in the fall. Going to school for three years I crossed there  
during the summer time, from March until it got cold weather

in October. The school was at Channahon about three and a half miles on the other side of the river. We got our  
3427 family supplies at Channahon sometimes from Joliet and Wilmington. I had occasion to go to Channahon for supplies when a boy. I forded the river, drove across with the team. I have walked across. I never knew of any navigation on Desplaine's river; never knew of any boat having been taken up or down stream or carried down stream, carrying on any kind of commerce. I know there could not any boat of any size be taken up that river at any time during my lifetime, and not now either.

3428 I am familiar with the river below Treat's Island. I have crossed the river at Brandon's bridge. Have seen it nearly every week. I have seen the river near Brandon's bridge before 1871, perhaps once a month. I saw the river below Treat's Island before 1871. There were some boulders below Treat's Island. I crossed at just about where the Smith bridge is now, perhaps 20 rods above it. There was a stretch of riffles there, and quite a good many boulders.  
3430 The boulders are not exposed now, they were at that time. They were exposed in the summer season. That was at Smith's bridge. There were a good many boulders all the way between there and Joliet. At Brandon's road I think there was a drop there of a quarter of a mile. I have been down the river as far as the mouth a few times. The boulders in the stretch I have described were scattered, some of them were out in the middle and some near the sides. I have had to get out and shove over the boulders lots of times.

3432 The place where my house is is called Millsdale. There is a bridge crossing the Desplaine's river there. There used to be a ford right opposite the houses, just above  
3433 one of those riffles, we called them riffles. The riffles were pretty rapid; there were several large boulders in there so we used to go above those boulders and when the river was high, we generally had a mark, we could tell  
3434 when a certain boulder was covered with water it was not safe to cross. This ford was about 80 to 100 rods down the river below the head of Treat's Island, and there was riffles all the way up; there would be a riffle, and then there would be a little place where the water would be deep. The water in this ford during the summer season was about a foot or so deep. It would be deeper in the ford than it would be on the riffles. It was not deep enough to do

any harm; you could drive clear through there because it was smoother. Some of these boulders along Treat's Island would weigh about a ton or more, two or three feet high. There 3435 was a boulder above that ford that is five or six feet across the top and I presume it was three or four feet high; it was near the center of the channel. On the east channel there is two different places that I have crossed by stepping from boulder to boulder, one just below this ford, and the other one at about probably 50 rods up the river. I never did cross below the rapids that way. Have seen the Desplaines river near its mouth many times. Since the Santa Fe railroad was built in 1884 or 1885, I have been up over that road 25 or thirty times a year. I have seen the 3436 river when there was not any water in it scarcely at all. In front of the depot at Lemont is a solid rock bottom, and I have seen it there when the water did not scarcely run. I don't suppose there was two or three inches of water 3437 there. I have seen it in that condition a good many times, generally in the summer. When we have a freshet, it would take some little time for it to run down. There at my place you could ford the river in two or three days after a freshet. Prior to 1900 I have never known of a week that I could not ford the river.

*Cross-Examination.*

I lived on the place all my life. Was in Chicago two or three years but was back and forth all the time. Channahon is a little river town on DuPage river. I don't think there is over 100 people there. The school I attended was a high school; went there about three years, commencing in the 3439 fall of '68. I remember Grant running for the presidency in 1868; remember when Grant took Richmond. I distinctly remember when my father died. I was about three or four years old. I remember the old saw mill and I remember riding on the carriage that carried the logs. The logs were on the bank and they rolled them in and were put on what I called a carriage, it was an up and down saw and carried the logs against the saw. I don't remember how long the mill was, it was a wooden one story affair. There was a slope so they could roll the logs down onto the carriage. The dam was built of logs, a log placed here and there and then slabs put back and stones piled up on the bottom of

those slabs. I don't imagine the dam was over three  
3442 or four feet high. They used some of those boulders.

I have seen the water pour over the top of the dam;  
it is quite common in the spring time. The water would not  
stand in a pool behind the dam; there was too much fall.  
Above the dam was Lake Joliet. The water behind the dam  
would be held back four feet deep. That dam was across the  
east channel, and there was another one across the west chan-  
nel and a little farther down. One of those dams between

the main island and the little island, a small part of it,  
3444 was built in that same way, and the balance of it was  
just boulders in there. The dam between the small

island and the large island, started at just about where this  
millrace starts in. It must be four or five rods below the end  
of the island. The center of the dam was a little further

down stream than the two ends. (Witness indicates on  
3446 map the location of dam.) There is a strip of land be-

tween this millrace and the river, I should judge about  
three or four yards wide, and the river is so much wider now  
because there is a good deal of it washed away. I can show

you where the old millrace was if I should go down  
3447 there. There was a dam right here near where they  
run that grist mill. I don't know whether they had any

dam on the other side or not, I should judge perhaps they  
did not. (Witness indicates on map location of grist mill  
and dam.) The grist mill was a much older mill than the

saw mill. I don't remember anything about the grist mill  
only the ruins and the mill stone I have seen. If I saw a

statement in Woodruff's History of Will County that in 1837  
there was a grist mill on the east side of Treat's Island, I

would take it to refer to this mill. I don't think it was  
washed out. I think it went into disuse and tumbled down

and perhaps it was carried away; I don't know. It was  
3449 all gone before I came upon the scene. The dam was

not entirely obliterated; there was a part of it left there.  
There were some boulders all along there.

Q. You spoke of this first dam being in three sections,  
one across the east, and then one across the middle, and then  
across the west channel.

A. Yes, sir. But I didn't speak about this little millrace  
that ran down to the grist mill. Of course, they had the dam  
there too.

The dams across the east and across the west channel were  
made by laying some logs crosswise of the stream and putting

slabs behind these, then piling the boulders on the slabs. In the middle it was made by simply gathering the boulders together, a portion of them. The water would work its way through the middle channel some. The millrace was artificially made by digging out the ground, probably twenty  
3451 or thirty feet wide. I saw the water run in there bank full and run over on each side. When the water run over the top of the dam, if the dam was four feet high, of course it would be four feet behind. There was a good deal of the time when it didn't run over it, only in high water. And then there would be considerable time when it would stand about level with the top of the dam; it would run over the top of the dam only for a short time. When it ceased  
3453 to run over the top of the dam, the water would not stand full to the top of the dam. There was a great deal of water seeped through; the dam was not very tight. It was not well built as they build dams now. What you call a mill pond is Lake Joliet; some places in Lake Joliet there was twenty feet of water. The object of the dam was to raise the water enough so they could run water through this mill race to run the mill.

The bridge marked on the map near my house is an iron bridge with a stone abutment at each end. It was put in, I think, in 1895. My house is 30 or 40 rods from the Millville  
Station. I never carried on the mill. I don't think they  
3455 run that mill later than 1859 or 1860. I don't remember that the dam was washed out and that they replaced it more than once before they stopped running the mill. It was not washed out at once; I think it was washed out gradually. I didn't see them building any dam. I presume it was by gathering boulders together.

3456 My business has been stock raising, farming, and I was in the tile business a few years, manufacturing tile at Millville. I employed about eight or ten men making drain tile, commenced about 1883, stopped somewhere about 1885. My main business was farming.

3458 I made a contract to sell the island to Mr. Charles E. Munroe, March 5, 1904. Upon his paying the purchase price within four years he was to have the property; he did that and I transferred the property to him a few weeks ago, or to the Economy Light & Power Company, the defendants. I came up to testify at their request. Don't think I ever talked about the dams until just the last day or two. Don't think I have any talk with Mr. Munroe about the river, even



until just recently. I don't know the horse power of the sawmill. I don't know what kinds of a mill it was. It must have been a sort of a turbine wheel. The wheel was down in under the mill, and I think a vertical shaft went  
3460 down from the mill into the wheel pit. I think the mill was there before my father was interested in the place. There was a good portion of the year when there was not water enough to run it; in the winter time and only a little while in the spring, I guess, they could run it.

To build the fences described, we took rails and flattened off the ends and drove the posts down in the bed of the river and spiked those rails on to those posts, the same as you  
3461 would a board fence, only using the rails instead of boards. The ice would carry the fences out and they would put in new ones.

In the west channel I have crossed by stepping on boulders at a point just a few feet below the bridge. (Witness indicates point on map.) I have also crossed it just above  
3462 the bridge. There was a ford right here where the road comes down to the river, but it went out on the other side below the bridge. The ford was smoother than on either side where the boulders were. There were small boulders all the way up the stream to the upper end of the little island; above that, it begins to get deep, and I have waded up there, 20 or 30 rods, and there was not more than a foot or 18 inches of water, sometimes in the summer. I never went in up at the upper end of Treat's Island, it was too deep. I never  
3464 learned to swim. Up above Treat's Island there was about 22 inches of water. There were boulders all along the channel of that river, as far as I have ever been, and I have been wading up and down that river from the upper end of the island to the lower end. On both channels, it is just the same.

3466 I do not know personally that there were boulders in the west channel above the upper end of the little island because the water was too deep. I didn't hunt for them. (Witness marked on map location of boulders "K-prime.")  
3469 There were boulders down 12 or 15 rods below the end of the island, below the rapids, until you came to deep water. Then there is a stretch of deep water there for a mile or more with boulders all the way down to that deep water, and I presume there are boulders in there. I refer to the same thing by the words, rapids, ripples and riffles. I would call it a riffle or a rapid where the water drops and



goes down pretty rapid, and then it will come to a little place where there will be a little pool, the water will be deeper, maybe three or four feet of water there, for just a little ways; then you will find another raise in the ground and the water runs over that rapids, runs down still a little lower. There is a fall, as I understand it, of about eight feet between the upper end of this island and the lower end, so that it is not all in one place. It gradually drops, and near the upper end is more of a drop than there is over this point here from below, where the old mill was, to almost the lower end of the island. There is not very much of a drop there.

3472 A little ways below the saw mill it did not run there. There was a gradual flow and there were no riffles there. Then when you get down almost to the lower end of the island, 20 or 25 rods above the point of the island, it begins to drop again and the water runs very rapid there till you get about that distance below the island.

3473 At the upper end of the island, from where the old dam was there is quite an incline to down about just below the grist mill. I didn't say I crossed those old boulders at the old dam, I crossed it right in here somewhere (indicating). About that point I have crossed there dry shod, stepping from one stone to another. There were not great big boulders. If there were places between it that I could not step, I would stoop down and pick up a stone and throw it down there and make a step. You could move the stones into stepping stones. I have crossed there perhaps 50 times in my lifetime. When there was not a stone near enough, I would roll one up from the channel into the place, so as to make a passage, and when I crossed again if there was a gap, I would roll another. I presume other people did the same. In the ripples at the other end of the island, the drop begins near the upper end, since the dam is out it is rapid all the way down. After you get to a point where the old dam was, it begins to be more rapid, more of a fall, and the water comes down there faster than you can walk, all the way down. (Witness indicates on map where riffles in east

3477 channel begin.) You might call it a riffle all the way down. The water will go down there and then there will be a little quiet spot and then it will go again. When you get to this ripple, twenty rods above the bridge, that continues just below the bridge. There is where the little pool is, from about a point say twenty rods above the bridge, down to just a little below it, the water would not run as rapid,

and from that point on down below the ford, twenty or thirty rods more there is another rapid place, quite a drop there. Then from that point on down to near the lower end there is not very much fall.

3478 The ripples on the west channel commence at the upper end of the little island and it is all the way down to the bridge, below the bridge, about fifteen or twenty rods. It is not so rapid then until you get down to near the lower end of the island, then there is a drop. The ripple on the west channel as it passes the extreme tip of the lower end of the island merges in with the ripple from the east side, and 3479 they both run out together, about fifteen rods below the point of the island; then there is quiet water from there on down. The water overflowed the whole of Treat's Island in 1865. I do not remember how it was in 1867. When the deep cut came down there used to be boulders exposed in the winter time. Since the opening of the Sanitary District in 1900 there is one boulder that is exposed every once in a while, that is about where the old mill race was. I think I have seen that boulder exposed since they shut off the water. When the water goes down to its normal condition, the same as it is flowing every day, sometimes there is more water one day than there is another, then I can see the boulder.

3481 Millsville is a station on my farm on the Santa Fe. I see the river at Lemont from where the railroad crosses. I never made any further examination.

*Re-direct Examination.*

3483 I closed the sale of Treat's Island to the Economy Light & Power Company in March, 1908. I don't remember when I first talked to anybody with a view of testifying in this case. Mr. Kercheval came down to my place just a few weeks ago and asked me to come up here. I think it was after I had closed the sale. It was about the time this trial commenced. Nothing was said before the sale was closed about my being a witness. I could get a good view of Desplaines river from the car window at Lemont. The river is right up to the embankment. The railroad runs right alongside of the river. Before the Sanitary District diverted the course of the river it came right up by the depot. I should judge the railroad run alongside of the river nearly half a mile. In looking out of the car window I was not able to see much of the water; it wasn't there. I could see the

whole width of the river for about half a mile, perhaps not so far; I couldn't see any water except just in little places. I didn't see any running water.

JAMES CORNELIUS, a witness called on behalf of defendant, testified:

3485 My name is James Cornelius, live in Village of Wilmington at present, on the Alton road. Have lived there since two years last January. Lived on a farm in the town of Channahon in the southwest corner all my life before that. Came there when I was 3 years old. I am 63 now. That farm is right on the south bank of the Desplaines river, I should say about a mile and a half or two miles above the mouth. Two and a half or three miles northeast from the township line.

I knew of a dam across the river near its mouth at the place called Dresden Heights. I should judge it was about twenty rods below the county line, in the Desplaines river. About a quarter of a mile above the mouth of Desplaines river. I saw it first when I was a small boy, eight or ten years old. There used to be a saw mill there at that dam. There is some of it there yet; it has been washed out by degrees. I think there was a saw mill there when I first saw it. If I recall right, it was sawing lumber when I first saw it. I suppose it was a wooden dam. It stretched clear across the river, probably two and a half or three feet high. It remained there about fifteen years after I first saw it.

3488 I have had occasion to observe the condition of the river all along time and time again, from the mouth up, ever since I moved there. I am speaking of the river near its mouth. We used to cross it below this dam, used to ford it prior to 1871. There were boulders all through it at what we call the bend, Dead Man's Hole, below the dam. The boulders extended probably twenty rods along the drift, what they call the rapids, from the dam down. There was deep water there above the dam. There were no boulders exposed above the dam. If I recollect right, the boulders were scattered all the way down below the dam, about twenty or thirty rods. They ran, I guess, from 6 inches to 2 feet, some of them, in diameter, through. Some of them maybe more. There were quite a few. They were scattered through

the channel. You would have to dodge around those  
3491 boulders with a skiff. You could see the river from  
our house. Never saw boats, except rowboats, going up  
and down. Never heard of any boats carrying any kind of  
commerce or produce going up and down. Nothing but some  
trapper, setting traps, or something like that. That would  
be a common rowboat. It would be going up and down, both.

*Cross-Examination.*

3495 I have been living at Channahon and farming from  
1848 to 1906. The dam was about two miles from where  
I lived. I never got out and climbed on what was left of the  
old dam. There was a ruin of an old mill on the other side  
of the river. I never saw it in operation. I was in the room  
when Mr. Mills described the construction of the dam at  
Treat's Island and heard him describe it. I think this dam  
was put in in the same way as the other, with slabs put on it,  
and scraped up underneath, and put on top. The water used  
to pour over the remnant of the dam most of the time; in  
low water it used to go down in what we call the tail race.  
The dam was gradually washed away until just the riffles  
were left. The washing away began as far back as I can  
remember. It was substantially all out fifteen years after  
I first saw it. This Dead Man's Hole was kind of a whirl  
hole, I never was in it. They used to swim in the aqueduct.  
There used to be an aqueduct in the feeder. The water there  
was 4½ to 5 feet deep. I never knew them to go swimming  
in the river, the aqueduct was too handy. I learned from  
my father that the boards in the floor of the house were made  
at the old mill. I recall helping him to draw lumber from  
there when I was a boy. I think the house was built the same  
spring we moved, when I was three years old. Afterwards  
we hauled lumber for the fence; that was when I rode with  
him, maybe five or six years after.

*Re-direct Examination.*

3499 I do not recall the boys swimming in the river below  
the old dam. I don't think there was water enough  
to cover them part of the time, without they would go in  
these holes, like Dead Man's Hole. I have forded the rapids  
above there when it was just sifting through the boulders  
down around the rapids. Scarcely any water at all, and then

I forded it when it was deep in case of rain. After the spring freshets the usual condition of the river was kind of riffy. In some places it would run through a little crevice, just sifting down; that would be, I should judge, say twenty rods above the dam.

JEREMIAH COLLINS, a witness for the defendant, testified as follows:

3529 My name is Jeremiah Collins. I live in Grundy County,—will soon be 88 years old. I came from Albany County, New York, in 1834, to Grundy County, came by water to Chicago and by wagon from there. There was no other method of getting down there that I knew of. We crossed the Desplaines in coming. There were no boats running down the river at that time that I heard of. I have lived on a farm ever since I came to Grundy County. We used to go up to Chicago by ox team, and with horses, before the canal was opened. I live in Town 34, Range 7 of Section 13. I am about five miles from the Illinois river, and over six to the Desplaines. If my memory serves me right, there was some of our neighbors went up to the mouth of the Desplaines river when we first settled in Grundy County; what makes me recollect it is the big weeds that hung over this way (indicating) and we drove right under.

There were no buildings near the mouth of the Desplaines when we first came there, nor any settlements between there and Chicago. I have never seen any warehouse situated near the mouth of the Desplaines, nor never heard of any. We used to go up there with our cattle and feed them in the fall of the year on blue grass, I never noticed the mouth of the river particularly. I could ride across the mouth of the river there most any place. I never knew or heard of the river being navigated. Mr. Treat had a mill at Treat's Island, there was water power there. That is the only thing I know the river was used for. I knew Johnny Beard. He built a dam and saw mill about 1836 or 1837. I do not know whether the dam was there after they built the aqueduct or not. That was built in 1848.

3536 I knew Henry Fish,—he had a store where they built the locks at the Aux Sable. I do not know any way

that he could have got his supplies except by team. I never heard of his getting supplies by boat down the Desplaines before the canal was built. I never heard of anything of that kind. I never heard of there being a corner on salt. We got our salt from Chicago by team. I never heard of any salt being brought down the Desplaines on boats. The farmers who settled the country below me on the Illinois river went to Chicago with their produce in teams. I never heard of any farmer taking his produce up the river in boats.

3537 I never heard of a man named John Hamlin having a warehouse at the mouth of the Desplaines for storing goods to be shipped up the river by boats. I don't believe it would have been possible for a warehouse to have been there since 1834, or I would have seen it. I remember when the Jessups built a house on the DuPage river. I do not know where they got the lumber to build their house,  
3538 unless they got it from the saw mill on the DuPage. That mill was right south of where the bridge crosses the DuPage now. A man named Will Campbell, I believe, from Ottawa, built the mill, and Treat built the dam. It was probably a mile from where they built the house.

3539 I have never seen any navigation on the Illinois river along where my farm was, nor heard of any above Ottawa. I don't think there could have been any without my knowing it.

*Cross-Examination.*

3540 I have not sold any land to the Economy Light & Power Company, I don't live within five miles of them.

CYRUS COPELANTZ, called on behalf of defendant, testified:

*Direct Examination.*

3678 My name is Cyrus Copelantz. I live in Joliet. Have lived there since 1866; from '54 to '66 I lived five miles southwest from Joliet on the east side of the river. Came to Will County in 1854 when ten years old. Lived on farm two and a half or three miles from Desplaines river. In 1866 went into butchering business in Joliet. Was in the  
3679 livery business in 1880-1884. In the boot and shoe business from 1880 to 1884. Moved to Kansas City in 1884,

back in 1891. Lived in Joliet since. From 1854 to 1871,  
3680 I was along and across the Desplaines river at various  
times, often. Possibly every week or two weeks from  
'54 to '66 but from '66 to '80 and since, except when in  
Missouri, have been along the river almost every week. Am  
acquainted with it from Channahon, that is ten miles below  
Joliet, up to Romeo, above Joliet. Have seen the river below  
Channahon, but not very frequently. In the years prior  
3681 to 1871 the condition of the river would depend on the  
rainfall. In the spring there would be water flowing  
all the while up until along the last of May, and as the sum-  
mer season came on, the water would diminish in quantity  
until in places there would not be any to speak of. Other  
low places, there would be water the year around in holes.  
From the last of May to the first of November there would be  
water in places and in places it would not be dry, but there  
would be no water to speak of. There would be no run-  
3682 ning water seeping along in places. The bottom of the  
river varies and is not level. There is a space at Treat's  
Island from that on north up the lower end of what is called  
Lake Joliet, there is riffles there that would not have much  
water there, and then after we got to the north end of Lake  
Joliet, up near Brandon's bridge, up to what has been called  
Adam's Dam, it is riffles, and there is no water to speak of  
at all. You can walk across any time. I am acquainted with  
the riffles; they extended from Adam's Dam south down  
towards Lake Joliet, about a mile; in those riffles were bould-  
ers which varied in size, some three feet through, some two  
feet, and so on. They were numerous. Also down at the  
lower riffles at Treat's Island. On the riffles from  
3683 Adam's Dam to the head of Treat's Island, in the years  
before '71, there would not be water to speak of at  
times there. The average condition along that riffle in a dry  
season or an ordinary season there was no time that the  
water was so extensive but what you could walk right across  
it without getting your feet wet, on the stones. Some sea-  
sons it was that way during practically the entire summer  
season. In the ordinary season, that is, an ordinary rainfall,  
the water would vary, when the rains would come; there was  
no time but what you could get across there without any  
trouble. There was enough water along that riffle to  
3684 float a skiff in the spring of the year, after the freshets,  
but not that I know of during the remainder of the  
year. I could not tell you just exactly how many boulders



were there, but I know they were very numerous. A fellow would be in danger, if the water was high enough for him to go down with a skiff, in getting by them. I know some fellows tried it. There was a friend of mine and his boy tried it and he ran into one and upset his boat. I was at his funeral.

There is a riffle down near Treat's Island, that is at 3685 the south end of Lake Joliet. They were not so rapid, the fall is not so great as they are at the north end. I should judge they were from a half a mile to three-quarters of a mile in length; say half a mile. I did not see those as often prior to 1871 as I did at the north end. I have been there when there was no water to speak of at all, and walked

right across just above there, and again when there was 3686 a little more water; it varied. The quantity of water would be about the same as it would be at the north end. I never saw enough water along those rapids at any time after the spring freshets when it would be possible to float a skiff. There were boulders along there so numerous a person could not go down with safety when the water is high enough to float a boat without being in danger. They are all over the channel. I never saw a boat there after the spring freshet was over. There is one small riffle still down quite a ways but I am not very familiar with it. I never

was there but once and the water was very low at that 3687 time. That rapids is along near Smith's bridge. There were numerous boulders there, not so many as at Treat's Island. Prior to 1871, I have been down to the mouth of the river. I don't remember the conditions there. Before 1871, I have crossed the river at a ford at Brandon's before the bridge was there; also at Channahon. I have been in a rowboat on Lake Joliet. We used our boat to go across to the swamp on the west side to hunt for ducks. There were several rowboats there used for the same purpose. Never knew of any boats being used on Lake Joliet for any other purpose. I never knew of boats either going up or down the Desplaines between its mouth and Adams' Dam, prior to 1871. They cannot go up, there is no use talking about it. It is impossible

for a man to row a boat up that river at any time of 3689 the year; that was so before 1871. When there was water the current was too swift and there were too many boulders in the river, and when there is not water, they cannot row boats. Never knew but the one boat I spoke of awhile ago going downstream from Adams' Dam to the mouth of the river; that was the one the fellow got

drowned in. I don't know that the boat was capsized;  
3690 know that they got drowned. They started in a boat  
and we found the boat and one of the boys very close  
by. That is the only time I recall anybody trying to take a  
boat down. I never heard of any commercial navigation  
being carried on on the Desplaines river, either before or  
after 1871. I have seen the river frequently since '71, also  
since 1900, when the Sanitary District commenced to dis-  
charge water into it. You cannot row a boat on the river  
from Jefferson street—from the upper dam. The current  
is too swift. I have heard of one or two men that went  
3691 down in boats but they never came back. Since 1900,  
I never knew of anybody trying to take a boat up the  
river above Lake Joliet. I never knew of anyone trying  
to take a boat up from the mouth of the river as far as Lake  
Joliet, or any point below Lake Joliet.

*Cross-Examination.*

3693 When I was a boy living on the farm I saw the river  
occasionally. Generally went down there on Sundays  
instead of going to Sunday School. After we got our fall  
work done and our spring work done, and wanted to go hunt-  
ing we would take a day off. When we lived in Joliet, I  
would see the river oftener in the city than any other place,  
but in buying cattle and driving we were up and down across  
the river. When I was in the boot and shoe business, I saw  
it less than any other time. I did not see it during the seven  
years I was in Kansas City. Since 1891 until the present  
time, have not paid much heed or attention to the river  
except as it appeared in Joliet. I was not identified  
3695 with river business of any kind. The rapids near Joliet,  
I should judge, I am simply guessing, was about a mile  
long. I have crossed the river on the rapids. I never went  
up and down the length of the rapids in the river. There  
was a ford over the rapids where I have crossed a good  
many times. Not every year for the last thirty years  
3696 outside of the time I was in Kansas City. I crossed  
with a team. Sometimes there would not be any water  
to speak of; other times if there was rain for a time or  
3697 a day or two ahead there would be twelve or fourteen  
inches of water. I don't remember that I ever crossed  
it when it came up to the wagon bed. I probably have crossed  
it when it was over the hubs of the wagon wheels. If it was

underneath the hubs or did not cover the hubs, I would not consider there was much water there. Don't know how many boulders there were in that rapids, never crossed them in a boat. Below that, I should judge it is close to five miles, 3698 there is another rapids. It commences at the north end of Treat's Island, I should judge they were half a mile long. I never passed over those rapids in a boat. I have crossed the river at those rapids with a team. I went over one branch of the river to Treat's Island and then crossed the other branch of the river. That was quite a while ago, when I was living on the farm. I have not crossed over the ford there since 1866. Don't remember just how deep it was then. There is rapids on each end of Lake Joliet. I never passed over the rapids at the lower end of Lake Joliet in a 3701 boat, nor through them. My observation of the boulders was had either from the bank or while crossing the stream. I would not say how many boulders there are. I have not noticed them since 1866. Since the drainage water is in you can see where they are, but you could not see the boulder proper itself. The water covers them. You 3702 see a disturbance of the water where they are. It is not literally true that I saw boulders two or three years ago, nor last fall, nor for the last eight years. The truth is I have not forded the river there since 1886. Have not 3705 observed the boulders except when I forded the river. They have built a bridge below there. Since the water is turned it, I did not go across that ford at all, because I could not. They built a bridge below and of course we do not come in contact with the boulders. They built the bridge in 1892. I have crossed the ford after 1866. Between 1854 and 1866 I crossed it oftener than I did since. I will not 3707 say positively whether I crossed the ford since 1866 or not. I am not clear about it. I might and I might not. I cannot call it to mind if I did cross the ford since 1866. I have not observed those boulders since 1866. Don't 3708 assume to know how many boulders they have there, nor their size. There is another rapids down the river before you get to the mouth but I don't have much recollection of that. I have been there once but I would not describe them. You could tell there was boulders in the river along the rapids by the action of the water running around them. I don't know how much water there is over them. I think the rapids extend the whole length of Treat's Island. I never measured so I don't know how long the island is.

3714 ISAAC W. RICHARDS, a witness called by defendant,  
testified as follows:

*Direct Examination.*

My name is Isaac W. Richards. I am 42 years old and live at Joliet. Came to this country in 1866, was 22 years old then. Live just outside the city limits, southeast. Have lived in and close to Joliet since 1866. Business is farming principally. Farm is six miles southeast of city, about four miles from Desplaines river. Lived on that farm eight years. After that, I lived in Lockport for three years; after that was living southwest of the city. Live in city now. I am familiar with the Desplaines river, commencing with Jackson street and down as far as Lake Joliet. During five years after 1866, I saw the river probably three times a week. When I would be in Joliet, I would have to cross the river at Jefferson or Cass street. Used to go down to Malcolm's mill where Adams' Dam was. There was a sawmill and a grist mill together. Would go down there probably once a month between 1866 and 1869. Would observe the river. The mill would be operated a very light portion of the year. My 3716 father-in-law took some logs there to be sawed in '68 or '69 and we had to take those logs over there. Could not get them sawed because there was not water enough. We took them away from there on the snow. I think my father-in-law kept them waiting there eighteen months. Did not succeed in getting them sawed. We took them up to Hickory creek, four miles, to Bevington mill. I think they were sawed there. We used to take grain to the grist-mill and some- 3718 times would be a good while in getting it. Would not take the grist there until the fall and would wait sometimes two months before we got it. They were only able to operate, I would say, in the fall and winter. Malcolm's mill is about four or five blocks below Jefferson street. From 1866 to 1871, the conditions were such as that there was very little water in the river. I have seen the river so low just below Dam No. 2 that I could cross the riffle with slippers and never got my foot wet, by stepping on stones in the dam. I could not say how long it would be continually in that condition but I might say for six months out of the year there is practically no water going over that dam. The spring

freshets would occur when the snow was getting off.  
3719 Sometimes would have a June freshet. '69 was a wet year. There was water coming over then more than any other year. From the period after the spring freshet throughout the summer and fall, there would not be any water going over there worth mentioning until November or into December. There would be just what would seep through the dam, just a few inches. Never knew of a rowboat being taken up or down the river between Jefferson street and Lake Joliet during the summer or fall. I don't think it was possible.

I recall the rapids from Jefferson street and Brandon's road. Below Adams' Dam the stream had a good many  
3721 boulders in it, lying promiscuously across the stream. They extended down as low as Hickory creek. They would vary from half a bushel to three or four tons. They were there before 1871 and have remained there since. I don't think it possible for a rowboat to pass down through those boulders; they were lying in such shape that if you dodged one, you would hit another, the rapids there being quite fast. I saw the river below Lake Joliet prior to '71, but not very often. I may have crossed the river at Treat's Island and I never noticed the condition of the river. I would approximate the stretch from Adams' Dam to north Hickory creek half a mile. I never knew of a boat used on the river  
3723 at any point for commercial purposes. Never knew of any boats of any kind being used above Lake Joliet. I used them on Lake Joliet for fishing purposes. There were other boats there used for same purpose, little rowboats. Never knew of any boats used on Lake Joliet for commercial purposes. I remember when the deep cut was opened into Lake Michigan drawing water to the river, in 1871. We got more water after the pump started. It killed all the fish  
3724 in the stream. The water was very dark. There has been no fishing in the river since then to amount to anything. I am familiar with the river since 1900 when the Sanitary District water was discharged into it. I have not known of any boats having been up or down between Malcolm's Mill and the head of Lake Joliet since 1900. It might be possible to take a boat down the river but I think it would be impossible to take one up, the water runs too fast. I have never known of any steamboat used for commercial purposes on the river, at any point, since 1900.

I came to Will County in the spring of 1866. I was 22 years old at that time. The first two years I lived in Will County I lived about a mile and a half southeast of Joliet, about a mile and a half, perhaps not that far, from the Desplaines river. I used to see the river pretty often, twice or three times a week, I would be in Joliet a good many times and always crossed the river when I was in town, generally at the Jefferson street bridge. At times I was at the mill, and at times I was hunting and fishing up and down the river. At Joliet, there was a very little water in the river most of the time, there was always some. We fished at the mouth of Hickory creek and down to Lake Joliet. We succeeded in getting fish there better than in the river. We got bullheads, bass, red horse and suckers. There were holes four or  
3727 five feet deep in Hickory creek, and possibly down about Lake Joliet there were holes in the river deeper than that. It is about a mile and a quarter or a mile and a half from Joliet to the head of Lake Joliet. I never measured it. We fished at the lake as much as anywhere; we set our lines out there.

3728 There was water enough, constantly, for fish to pass up and down the river if they wanted to, up as far as Dam No. 2,—that was the Jefferson street dam. I have seen the water so low there just below the Jefferson street dam that a duck could not float up and down it. He would have to walk, and he would not get his feet wet either. I have never seen ducks walking up and down stream, but I saw water so light in that stream that I could cross it in my slippers and never get my feet wet. I would step on the little flat stones in there, stones no bigger than a dinner  
3729 plate. They were about two inches thick. It might have been a hundred feet across the bed of the stream at that place. There was very little water there, a little seeping through the stone. I mean the stream was 100  
3730 feet wide. The bed of the stream was 100 feet wide, but the stream of water running down it would not be over 6 inches to a foot and a half wide between the stones, just a little water. There was no stream there that I would call a stream. I would not have to step on the stones to avoid getting my feet wet for more than half the distance across, say 50 feet, maybe not over 25,—that is a good while ago

to remember how far I stepped. I did not measure  
3732 the stones. The best of my judgment is that they were  
not over two inches thick. Some of those stones were  
just at the top of the water and some were clear out of the  
water. There was more water in the bed of the creek, there  
was more trickling down through the center. There was a  
little water running down there all the time. That was  
3733 in the summer time, anywhere between June and Sep-  
tember. Usually there would be a freshet in the spring,  
when the snow and ice melted, and at least as often  
3735 as every other year, there would be a June freshet.  
After that generally we would not get any water until  
at late fall we might get a freshet in November, or the first  
of December, just before the closing up for the winter.  
3737 The grist mill was there when I came to Joliet in 1866.  
It was there from 1866 to 1870, but I do not know when  
it was taken down. I took grists of wheat there to be ground,  
generally, buckwheat. I have waited for it to be ground for  
six weeks or two months. A fellow named Malcomb  
3738 run and operated the mill. My grist would consist of  
from 50 to 100 bushels, that was my entire crop of buck-  
wheat. I usually had it milled at one time, and shipped it to  
Joliet and sold it. There were other grists in the mill while  
I was waiting for mine to be ground, evidently,—I suppose  
my grist was waiting its turn. I took it for granted  
3740 that the mill did not run. I did not know how long it  
would take to grind the 100 bushels. I had buckwheat  
ground there in 1868 and '9.  
3741 I am living in Joliet now. I have been engaged in the  
wire business, and in selling western lands for some  
time.

*Re-direct Examination.*

3742 In regard to this grist which I had to wait to get  
ground in 1868 and '9, I could not say whether the mill  
was running when I took my grist there to get ground, I do  
not think that it was. When I had to wait so long to get my  
flour ground, I made inquiries why it was not ground sooner.

Q. And what did you learn?

A. That they had not water enough.

Objected to as hearsay.



JAMES G. ELWOOD, a witness for the defendant, testified as follows:

*Direct Examination.*

3743 My name is James G. Elwood. I was born in Lockport in 1839, and my family moved to Joliet in 1843, where I have made my home ever since, except when I was in the army and abroad and in school. My father came West in the engineering corps on the canal. That is what brought him to Lockport. I have been familiar with the Des-  
3744 plaines river more or less all my life. I have been in the real estate business since 1861. I have been interested in waterway questions and drainage questions out in that vicinity and have been a representative for the City of Joliet, on the Illinois Valley Committee, in opposition to the Chicago Drainage Plan. I was interested in having the deep waterway put through down there.

3745 I waded across the Desplaines river in Joliet many a time as a boy, and fished in it a great deal, and have traveled up and down it. The river has at times been so dry that no water was passing through it. My first recollection of wading in the river was before the canal was opened in 1848, and after the canal was opened there has been many years when there was not sufficient water passing down the river to supply the Channahon level. I have seen the sluice gates at Jefferson street bridge, or Dam No. 2 I think it is called, wide open and the lock gates at the guard lock that were formerly there, opened wide. Not the slice gates in the lock gates, but the gates themselves with every drop of water was coming down the Desplaines river passing into that Channahon level, and the canal; and I have frequently crossed the river on the old stone Dam No. 2 on the crest of it, with the water three or four or perhaps five feet away from the crest. We waded between that dam and the

3746 Adams Dam many a time with no water flowing down the stream, so far as I can recall, whatever, except some possible seepage through the Stone Dam. That condition existed, in frequent years, but I would not be able to say how long it existed each season. The river has sometimes been so full of water as to make it serious and uncomfortable for us in Joliet. I recollect in 1866 it flooded a section of the country I am interested in. That did not last more than four or five days. Prior to 1871, we called it a dry stream

during the summer season. I think so far as I am able  
3747 to recall almost every year there were times when there  
was no water passing down the river. There may have  
been years that it did so, but my impression is that there  
never was a year until the deep cut was made in the canal  
but what it was dry—that is, no flow of water. Before 1871,  
I had been down the river several times in a skiff, when  
the water was at ample stage. We would put the boat in  
just below the Adams Dam. The water then was just high  
enough so that we could get over the boulders, and those we  
could not get over we would try to dodge. I don't think at  
any time that I have been fishing down there but what I could  
wade across the river without my clothes off without any  
serious trouble. Not much higher than that (indicating his  
stomach) except in cases of extreme flood. I went down to  
the mouth of the Kankakee in my skiff, to the junction of the  
Kankakee and Illinois rivers. I had better success below  
Lake Joliet than I had from Adam's Dam down to the lake.  
We upset once, on one of those boulders near the mouth of  
Hickory creek, but we were able to dodge the boulders around  
Treat's Island. My fishing experiences and vacations were  
usually taken along the latter part of April and through the  
month of May. There was a remnant of a dam in the west  
channel below Treat's Island, and there was a number of  
boulders in both channels. I do not recall any rapids at the  
point called Smith's bridge. In going down the river, I never  
went beyond the Kankakee feeder. We made a portage  
3749 there over into the canal, and came back by the canal  
into the lock and back home. It was easier as a rule  
to make the portage there, we were told. I never took a  
boat up stream I have no desire to go up against the current  
or the boulders. It would have been possible with sufficiently  
strong pulling oars to have taken a skiff up the stream at  
any season of the year before 1871, from the aqueduct up to  
say the Jefferson street bridge. The water was amply deep.  
I never knew of anybody doing it. The only upstream boat-  
ing I ever knew of was on Lake Joliet, where there was no  
current perceptible, ordinarily. I have never known of any  
boats, skiffs, or other boats used for commercial pur-  
3750 poses on the river, only for pleasure. I would not  
venture to send any merchandise on the river by any  
kind of boat adapted to commercial purposes.

Shortly after the deep cut was made, the water became

so black and stagnant and foul that no fish, snakes, or turtles lived in the river at all, and that was the condition until the Drainage District opened their supply, except when there was a very heavy freshet. I have not known of any boats being used on the river between Joliet and Ottawa for commercial purposes since 1900. I would not want to risk the enterprise. I have not seen skiffs on the river since the water was turned in in 1900 except down at Lake Joliet a dugout or scow boat, in passing over the bridge. They were used for hunting or fishing,—I have used them myself.

*Cross-Examination.*

3752 At the upper dam, or Dam No. 1, the water, whenever there was enough for it, ran over the dam. When there was not enough it was let through the lock gate or the sluice gate on the east side. Dam No. 2, the Jefferson Street Dam, —there was a basin between the two dams, extending about five-eighths of a mile—and the Channahon level was let out from this basin, at the ordinary full stage of water in the Channahon level. In speaking of the Channahon level,

3753 I mean the level of the canal. There was a guard lock there for the purpose of preventing overflow of water, and for providing more water than could be passed through the sluice gates, which were also feeders. The sluice gate and guard lock were feeders to that portion of the canal which extended about eleven miles between Joliet and Channahon, and called the Channahon level. My opinion is that in low water, every drop of water that could be obtained from the Desplaines river was turned into the canal and as I said in my direct testimony, the lock gates themselves were swung wide open and fastened opened so as to let all the water run through the width of the lock as well as the other gates.

3754 The Du Page river crossed the canal at Channahon, between two locks, and the level following down the river from Channahon is fed by the water between those two locks, part of which comes down through the Du Page river when there is water flowing. The excess that didn't follow down onto the next level below passed over the dam and went down in the Desplaines river below Channahon. The Du Page river comes in from the north, and crosses the basin between the two locks there. Its water is poured, in the first instance,

right into the body of the canal, and then when the canal had a sufficient amount of water in it the balance of it passed over the side and into the valley or bed of the Desplaines river, so that from Channahon at the crossing of the canal in the Du Page river at Channahon, whatever volume of water

there is either in the river, or in the river and canal together, which is not required for the canal beyond that, is put back in the Desplaines, that is, the excess over and above what is needed for that next level comes back into the canal. The canal is 90 feet across at the surface, and slopes in somewhat at the bottom, depending on whenever it is a stone wall or dirt. I think about 60 feet is right, including the beam bank and towpath. The average depth is about five and a half feet, and as a rule there is plenty of water.

3756 The deep cut was made in 1871, but the pumps were not started at South Chicago until about 1883. It was the sewerage from the city that killed the fish. I have waded across the river up the center of it almost all the way from opposite the penitentiary clear up to Lemont, that is, above where the water was turned into the canal and prior to 1871. The places I picked out were the shallowest, I do not know how deep it was in the deeper places. The river was virtually dry; all that section is a flat, limestone bottom, and I cannot tell you how deep the holes were, but I did not get over knee deep in any of my wading, not over my rubber boots.

3757 Above where the Desplaines river discharges itself into the canal, the water in the canal, the upper basin, was from 12 to 14 feet deep before the sewage was turned in, and the deposit made there. Above the basin, on the next level above, between the twin locks, I think the water was five and a half feet deep all the way in the canal.

I never went with a boat below the old feeder, the Kankakee feeder, which is about three-eighths of a mile from the mouth of the river. Then I transferred, and made a portage going back into the canal. We found no great difficulty in getting the boat down that far; we upset once or twice, but that was part of the fun. The water was a little over knee deep, so that was no real danger except our provisions got wet

3759 and our powder would not stay dry. Just below Treat's Island, the river at ordinary stage of water was from 70 to 90 feet wide. The channels on either side of Treat's Island were neither of them in my judgment 75 feet wide, although if a survey were made showing them to be 100 feet wide, I would yield to the engineer who had measured it. I

am only giving my eye in measurement, and from wading across, just as it impressed me. I am speaking about the width when I used to go fishing there.

*Re-direct Examination.*

3760 I have been wading up the river above the upper basin, above where the river was discharged into the canal. I have been up there when there was no water moving at all, just little pools here and there. The bottom of the river is almost an entire flat limestone rock, very level, and there  
3761 are places—I suppose or know there are holes there, but how deep they are, I do not know. The length and breadth of these holes depended on how dry the river was. There have been times when you could wade across dryshod from one bank to the other. The general condition when I have been up there, with but one exception was that there was no water running down. What time of year those visits were made, I do not know. I began wading across the Desplaines river in Joliet, before the canal was completed, I think about 1850 is about the time of my first recollection of paddling around in the river itself. It was before the bed of it was changed by the Drainage District. Above Lockport and before the canal was open, there was a certain time when the river was in the condition I have described, and other times, when there was water in there, it was a river.

W. H. WHISLER, a witness for the defendant, testified as follows:

*Direct Examination.*

3911 My name is W. H. Whisler; I am a steamboat man. I have traveled on the river all my life. I have had a license since 1870, and before I had a license I floated logs and lumber. My experience has all been on the Mississippi. I first commenced pulling oars, floating lumber, in 1865, from the mouth of the Chippewa, and went to Lyons Island. After that, we floated in different places through to St. Louis and different points on the river till we got to using small boats, then larger boats, running without oars. Then we got to running without oars. Then we got to running double rafts and  
3913 using the bowboats. The largest raft I have ever run was 290 feet wide, 1,422 feet long. My first license was

for pilot in 1870. Three years later I got a license for master and pilot. I ran second pilot for three or four years, then I got to be master. The first boat I run on was a little side-wheeler, then a small sternwheel, and then larger boats. I took out the steamer Dayton, 130 feet wide, 30 foot beam and about 150 feet long over all, in 1881, running for eleven years. Then they built a new boat, and I run her for the last year.

She was 137 feet long and 32-foot beam. We were in 3914 the rafting business. During the last year I have been running the Steamer Weyerhauser, a pleasure boat, 142 feet long and 33-foot beam. I have been familiar with navigation on the Mississippi since about 1865. The farthest run I have been was from St. Paul or Stillwater to Memphis, on floating rafts, but most of my runs have been to St. Louis, Albany and a great deal to Keokuk and Hannibal. But 3915 for the last three or four years to Rock Island. I have been generally familiar with navigation as it is carried on in the Mississippi between the points mentioned since 1865.

I have seen the Desplaines river twice, once from the shore. The first time was six weeks ago last Sunday—I went from Joliet to Treat's Island. I went down again this morn- 3916 ing from Joliet to the mouth of the river. I went up with an auto, and stopped at different places. We crossed the river several times on the first trip; only once yesterday, that the first bridge below Joliet. I am familiar with the Rock Island Rapids in the Mississippi, and have done a little warping and cordelling of boats. I understand the process. 3917 The Desplaines is very swift, swifter than any water we have on the Rock Island Rapids; very much narrower; it looks to me like there is a good many boulders or rocks on the bottom; I don't know what they are. When you go to the rapids, I can tell you what they are, but I have not been 3918 on the water of the Desplaines. I think there are boulders in the Desplaines because wherever the big falls are here is a big break in the water.

Q. From your observation or examination of the Desplaines river, I will ask you whether, in your opinion, that stream from Joliet to the Illinois river is, or is not, a navigable river?

Objection; overruled; exception.

I don't think it is navigable. I would say it is not navigable, by any means. It is too narrow, too swift. I don't think one could take any kind of a boat safe.

Q. Do you think it would be possible to carry on profitable commerce in any kind of a boat on that river between Joliet and its mouth?

Objection; overruled; exception.

I don't think so. I don't think it is possible.

*Cross-Examination.*

3919 In taking logs down the Mississippi, we floated them.

When we got in still water, we had to have boats to shove us between Lake St. Croix and Lake Pippin. Most of my work was from the foot of Lake Pippin to Rock Is-

3920 land. I was pulling an oar, for guidance of rafts, in

1867. I have seen the Mississippi when it was very

difficult to navigate. I have taken different length boats up

and down the (Moline) rapids—from 132 to 142 feet long,

32 feet wide, and from 180 to 216 tonnage. I do not know

what the fall is at the Moline Rapids. But take it at Moline

Chain, Duck Creek Chain, Campbell's Chain, Sycamore Chain

and Cabin Chain, is the heaviest chain. I think the Moline

Chain they claim for six miles there or about two miles, it is

six feet or something; I have heard that said. I do not know

anything about the navigation of the Snake river; never

3922 heard of the navigation on that river and over rapids

that are sixteen feet fall to the mile. If they do navigate

rivers of that much fall it is a kind of navigation with which

I am not familiar. I would not say that they could not do it;

I would not want to try anything of that kind. From my ex-

perience I would think it was impossible. I do not know

3923 anything about navigating rivers that have a fall of 25

feet to the mile. I think the Desplaines is too narrow

for navigation. The narrowest place on the Mississippi

where I have navigated it, the channel was supposed to be

200 feet wide. That is the rapids between Rock Island and

Le Clair, on the different chains, where they have dredged

out. The water there must be half a mile wide. The Des-

plaines looks pretty small to me after having had that kind

of experience.

3924 I do not know of any place where they are navigating

rivers not over 40 to 30 feet wide. I have never been on

any of those little rivers. I have never passed through

Crooked river, the little stretch of lakes down to Cheboygan

river, near Petoskey, Michigan. It is possible to navigate a



river 30 feet wide, crooked, so much so that it bears that name, by boats 75 to 100 feet long, depending on the depth of the water and swiftness of the current. If the water was 2½ feet deep, I don't know what you would take over her. You couldn't handle a boat unless you would drop a line. We don't handle that light draught boats. My experience is on a river that draws more water than that. My objection to the Desplaines is that the current is too swift and the stream too narrow—that is why I think it is not navigable. I have seen the Desplaines twice. The first time it was a wet, rainy day, and we went to Treat's Island, I think about 12 miles. We crossed the river three or four times, got out and looked at the river at several places, and from the bridges.

*Re-direct Examination.*

3928 The road runs along close to the river—we saw the river from the road as we went down, and at those points where we stopped and got near it.

3929 Q. I will ask you whether or not the obstructions which you mentioned in the river would have any effect upon its navigability?

Objection; overruled; exception.

A. It has.

Q. Has the velocity of the water anything to do with the navigability of a narrow stream?

Objection; overruled; exception.

A. It has; in the swift water in the whirls and rapids it is impossible to handle a boat, and if the boulders are in the channel you cannot sway from side to side and get your boat safely through. For instance, in low water, with a boat drawing three feet, and there is but four feet of water, her rudder is close to the bottom and won't take effect; she will run away from you, will go from one side of the river to the other; she will go to the rocks, and you have got to back up a hundred yards or two to get her and give her another pull, and come ahead on her again. Sometimes you will go down through a chain sideways to a place where you can't stop or start her again.

Motion by complainant to exclude question and answer as improper re-direct examination; overruled; exception.

JOHN McCaffrey, a witness for the defendant, testified as follows:

*Direct Examination.*

3932 My name is John McCaffrey. I am sixty-five years old, and have been in the steamboat business since 1865. I started in the lumber business on a small steamer in 1865, on the Mississippi. The boat was about 75 to 80 feet long and 16 or 18 feet wide. I have been in the steamboat business since that time from St. Paul to New Orleans. We run up the Chippewa and Hennepin Canal, ran a boat up the Illinois thirty or forty miles above Peoria, on the Ohio from Carroll to Golconda, on the Tennessee from Paducah to Florence, Alabama. I have been around the Mussel Shoats  
3934 on a boat; went around by canal. I have been up the Cumberland 100 or 150 miles. Governor Van Sandt and I were in partnership for fifteen years. I got my  
3935 first papers in 1865, as a master and pilot both, from the United States. I have not followed the river for three years. When I quit, I owned the Pen Brook, a boat 135 feet long, running between Paducah and as high on the Tennessee as Florence, Alabama. The last boat I built or had  
built was the Joe Long; I built her for the upper Rock  
3936 Island Rapids. I was a rapids pilot for 12 or 13 years. From 1865 to 1905 I followed the river. I have had experience with warping and cordelling boats; it was the only way to get up the Chippewa when we first started, because of the rapids. I have seen the Desplaines river, on the 25th  
or 26th of April, 1908, and again yesterday. The first  
3937 we crossed all the bridges down to Treat's Island. I took a look at the river, got off at the bridges. I went down the second time to the mouth of the Desplaines and Kankakee. I saw the cofferdam or work that was put up or commenced. The first trip we saw the river from the road  
3938 on the way down. It did not look much like a river to me—like a creek or slough. The water was very swift that I saw in there, and crooked, and seemed a very rough bottom from the way the water reared and pitched at different places, because of rocks or some obstructions. The water was very swift and very rough at the point where the dam is being built. It was not so rough at Treat's Island, but it was very swift and crooked. You could not get nothing up that way.

Q. From your observation of the Desplaines river, what have you to say as to whether or not the stream between Joliet and the mouth is a navigable stream?

Objection; overruled; exception.

A. I would say that it was not. I don't think you could get anything up there that would do any business.

3939 I began on a small boat about 75 feet long, and have navigated the Mary Morton, 200 feet long. The Desplaines would not be navigable for any boat that I have been familiar with on the Mississippi or its tributaries engaged in any kind of commerce. I never saw a boat that I think could navigate the Desplaines river for purposes of navigation.

COUNSEL FOR COMPLAINANT. I want it understood that I have an objection to all this.

The COURT. Yes, your objection stands to all these questions.

The river is too swift and too crooked, and there is  
3940 not enough water in it to be navigable. If there is not enough water over the obstructions, they are the worst kind.

Q. Would it be possible, in your opinion, to navigate the rapids of the Desplaines river by the method of warping or cordelling?

Objection; overruled; exception.

A. Not with a steamboat; it is too crooked, and there is not width enough in it. A boat can be cordelled on a stream the shores of which are heavily wooded, if the limbs do not stick out too far. You can lay a rope any place where  
3941 it is not too swift. You cannot cordell a boat if the stream is too narrow; you cannot keep it off the bank. When the water sets in to the bank, the boat will go in there. If the water sets out, the boat will swing out, going at a slant. It would not be possible to do anything with any boat I have ever been familiar with in a narrow channel and swift water by way of cordelling. You have no room. You could not cordell in the Desplaines; there is no water. It is not wide enough.

*Cross-Examination.*

3942 Most of my work has been done on the Mississippi and its tributaries. I have been down the Desplaines twice, on the request of some one who wanted me to come over here

and testify, and I made an examination on that account.

3943 There is not water enough in the Desplaines, and the current is too swift for navigation. A little stream can go as fast as a big one if you give it slope enough. I do not know what the slope of the river is; I did not take soundings. In my mind's eye, the water was swifter than anything I ever saw before. I have never been on the St. Lawrence, or

3945 the Fox, have never been on any river except what I told you. I have been on the Tennessee and the Ouachita. I was on the latter river with a boat 115 by 20, which

3947 would carry 80 or 90 tons. I call that a small boat. A flat bottom boat, with 15 feet beam, would have to be 15 or 16 feet long. I suppose that a boat 10 or 12 feet wide, to carry 10 tons, would have to be 20 feet long. I never operated a boat of that size, nor saw one operated—not a

3948 steamboat. I think there are some gasoline boats, flat-boats, scow built, that I have seen that would carry that much. I have never seen them navigating from point to point carrying freight for commercial purposes; they say there are some of them, but I have never seen them. I have never seen a boat of that kind on the Wabash or Ohio rivers; they may be there on the upper river.

3950 The shallowest water we have ever run on in the Tennessee river was  $4\frac{1}{2}$  feet. I have navigated a boat on less than that in the Mississippi, with a minimum depth of 3 feet. I have never navigated on two feet. I have done some

3951 warping of boats on the Chippewa and Ouachita rivers. The latter comes into the Mississippi about 16 miles from New Orleans. They have big boats running up there when the water is at a good stage. It is seven or eight years since I was up there. I warped a boat up there in one place. I do not know how steep the slope was; the river was pretty swift and crooked; it must have been 300 feet wide, deep in to the shore, and got shallow out in the middle. This was at a bend. We pushed the boat up to make a turn there. The slope of the Desplaines looks to me about double what we have on the rapids; I think it is about 18 inches to the mile on the rapids. I never knew of people navigating on

3954 rivers that had a slope of 10 or 12 feet to the mile, or as high as 6 or 7 feet to the mile. I don't think they could navigate a slope of 16 feet to the mile. At the Mussel Shoals of the Tennessee there is nine miles that has a slope of 80 feet; they have a canal around that.

J. W. RAMBO, a witness for the defendant, testified as follows:

*Direct Examination.*

3955 My name is J. W. Rambo. I am sixty-four years old, and reside at Le Clair, Scott County, Iowa. My occupation is that of a pilot. I have been following the rivers for 50 years. I got my first papers in 1864. My life work has been on what is known as the Rock Island Rapids, extending from Le Clair to Rock Island. I have been there for 45 years. Before that I worked as a raftsmen, and went from Stillwater to St. Louis for three or four years. I am still in active  
3956 work. I have owned three or four boats, operated at the rapids. My navigation has been entirely on the Mississippi, except one year I took a circus to Vicksburg.

3957 I saw the Desplaines river on the 26th of April for about seven miles from Joliet down the river, from different points along where we could reach it, and crossed the river on several bridges. Then again I made a trip down to the mouth of the river where it enters the Illinois, yesterday. We found rather a rough looking piece of water. From the appearance of the surface of the water there must be very rough and rugged and snarly bottom under it on account of the constant swirls and things on top of the water. Of course, we did not see any in most of the water. There  
3958 were a great many trees sticking out, but we did not see any boulders; but there must be something pretty solid under those swirls. I am used to that kind of water, but I have not seen anything where I lived that compared with it at all. These trees we saw were sticking out in the river. Just where the river empties into the Illinois there seems to be a very rough place, quite a fall.

Q. State whether or not, in your opinion, and from your observation of the river, the Desplaines is or is not a navigable stream?

Objection; overruled and exception.

A. I would say that no sane man would ever try to take anything up or down the Desplaines river in the shape of a steamboat. I would not go down it in a skiff.

Motion to have the answer excluded.

3959 I have navigated the river at Rock Island about 45 years. We can navigate the Rock Island rapids, and

we could not navigate this, and nobody else, I don't think. The normal low water stage of the Rock Island rapids is about 3½ feet—low water now; before it was improved I have seen it when there was not 20 inches in the channel, in 1864. That is the low water gauge of the Government, the lowest mark they know of. It was navigated at that low water mark; we had a little boat or two that we got over it at that time; she was about 85 or 90 feet long and probably 18 or 20 feet beam.

"The Enterprise," they called it. Twenty inches was 3960 the best water we could find. Aside from that one year before the improvements were put in, the normal low water flow over the rapids was 30, 31 or 32 inches. The boat that we took over in 20 inches used to carry a small amount of freight.

I have seen some cordelling. I have had plenty of it 3961 on hand. It is not possible on the Desplaines, on account of the bad shore; too many obstructions, and the water will not permit. It is a very swift water and crooked river. You can cordell wherever you have a shore to walk on. Cordelling is where you take a line, put it over your shoulder and pull something up behind you. Warping is where you fasten up above you and run a line down and pull up to that. In warping you have to have a little width

3962 on account of the sheering of the boat. She would run first one way and then the other unless you could hold her steady; in warping around a bend you are pulling straight toward the warp. The boat will not go around the bend and go straight toward the warp; you have to have side lines to hold her in the channel, and pull her first one way and then the other. It sometimes happens that your boat will swing off and present her side to the water; you have 3963 to have enough width to let her run a little, and then she will come back. I do not think a boat could be warped at Treat's Island rapids. I never tried such a job as that. I have had to warp a good many boats into the swift water of the Rock Island rapids a hundred times.

3964 Nothing in the line of a steamboat could go up that river. I don't know of a boat in our country that could go up that river, and I have seen them all, and handled pretty nearly all of them in the Mississippi for the last 40 years. I include all sizes and all kinds, and I am there for that purpose at the rapids.

*Cross-Examination.*

3965 There is about a foot and a half fall in the rapids at Rock Island, two feet at what we call Smith's Chain; Sycamore below that has three and a half, then there is two and a half, then Hamden's Lake, three miles long, where there is no fall at all; then Campbell, with a fall of a couple of feet, and from there to the Rock Island bridge I think the total fall is something like 21 feet. I think the distance is about 15 by channel. A 21-foot fall in about 15 miles, 1.4 feet of fall per mile. In low water there would not be  
3966 so much. The greatest fall in this distance is  $3\frac{1}{2}$  feet per mile.

3967 I do not know of any navigation on any river that has a fall of 6, 7 or 8 feet per mile. I have never seen anything of that kind; have never been on very many rivers; have never been on the rapids of the St. Lawrence. I have heard of the Snake. I do not know anything about the fall in that river, nor whether it is navigable or not. I do not think it possible to navigate a river with a fall of 16 feet per mile, with anything we have in the steamboat line in this country—that is, the Mississippi river and its tributaries. We have as good steamboats there as anywhere. Boiled down, then, to the final analysis, I do not think it possible to navigate a river with a fall of 16 feet per mile. I never heard of navigating a river with a fall of 25 feet per mile. I have  
3969 heard of the Fox river, and have run boats that have been running there, but they could not go up over our rapids here. I have run boats on the Rock Island rapids for 40 years; there are a lot of people who know the channel there, but who cannot take a boat over. That  
3970 is the most difficult rapids that I know anything about personally. I base my statement of the non-navigability of the Desplaines a good deal on my experience on the falls of the Mississippi. The smallest steamer that is operated on the falls of the Mississippi is about 75 feet in length. There are some electric launches, mostly pleasure boats, from 16 to 90 feet long, that go up and down the river. I have carried  
3971 lots of them up and down the rapids. There are also a good many larger steamers going up and down these rapids. I would not like to risk a boat 100 feet long on the Desplaines. The smallest steamboat that I spoke of, about 70 feet long, was about 17 feet beam, and carried 40 to 50 tons. I do not know of any boat carrying ten tons. A



boat 15 feet wide, flat bottom, carrying ten tons, would have to be about as long as she was wide. I think that a boat 30 feet long by 15 wide, built on the flat bottomed plan, would carry ten tons without any trouble. I am not operating any boat of that kind, have never seen any of that kind, under any kind of power; have had no experience with that kind of navigation.

Q. In your opinion, could such gasoline boats as you have seen on the Mississippi river go up the Desplaines?

Objected; overruled; exception.

A. There is nothing of that character on the upper Mississippi river, not that I have seen there.

Q. You were asked about a steamboat able to carry ten tons, 20 or 25 feet long. In your opinion, could such a boat go up the Desplaines river?

A. No.

My business as pilot on the Rock Island rapids is to replace the regular pilot on the ships, and take the boat up and down the rapids. There are five or six of us.

JOSEPH E. McCULLOUGH, a witness for the defendant, testified as follows:

*Direct Examination.*

4034 My name is Joseph E. McCullough. I lived at St. Louis, Missouri. I am sixty-two years old. I am a steamboat master and pilot. I have been a pilot for forty years and a master for twenty-seven years. I commenced to learn the river in 1862, served an apprenticeship until 1865, got my license from Cincinnati to Memphis on the Mississippi river, afterwards learned the river from St. Louis to New Orleans and commenced piloting there in 1867. Learned the Cumberland river just after the war, 1862 or 1863; I am a pilot from West Virginia—Huntington, West Virginia, to New Orleans and from St. Louis to New Orleans, and from Nashville on the Cumberland to its mouth. Was one of the founders and am president of the Pilot Organization, a benevolent organization.

The most rapid river I ever navigated was the falls of the Ohio and Harbor Shoals on the Cumberland. Took a boat over the falls of the Ohio twice this season. Have not been

over the Cumberland for a good many years. Have never navigated more difficult or more rapid waters in any river. Saw the Desplaines river in April, 1908, and again this morning (June 2, 1908), from Joliet down to the mouth of the river. I certainly think it is not navigable.

*Objection.*

4038 It could not be used for useful purposes of commerce. It is a hard-bottomed river with a very rapid current, very crooked and very narrow. I don't think that it would be possible for any steamboat on earth that I ever saw or ever will be here to either ascend or descend it. This river is much swifter than the falls of the Ohio or  
4039 the Harbor Shoals of the Cumberland. Much swifter than the Des Moines and Rock Island Rapids on the Mississippi. Never knew of any steamboat in my experience that could navigate the Desplaines river. Assuming that 450,000 cubic feet a minute of water has been added to the natural flow of the Desplaines river, I would say that in its natural condition it would go dry.

4040 I am familiar with the process of cordelling. It is just simply to get out with a lot of men, take a line over the shoulder and go to pulling. I am familiar with the process of warping, which is done by laying a line to the bank, or even laying an anchor out in the river, using your steam capstan and nigger.

4041 A boat could not be cordelled on the Desplaines river because it is too crooked you could not get out on the bank. Nor could a boat be warped, because you could not get any craft that you could lay an anchor with, and even were an anchor laid, a boat could not be hauled up the river by it, because the current would swing it into the banks. I have a boat that draws but two feet of water, and I would not  
4042 attempt to try to take her down the Desplaines. I do not think this river here could be navigated with a good sized canoe in safety.

*Cross-Examination.*

The steepest rapids I ever passed over are the Ohio  
4044 Rapids. The fall there is about 28 feet from the head to the foot of the fall, which is about two miles long. The shoals of the Cumberland river are a little over a  
4046 mile in length, and the fall is about eight feet. In shall-

low water they have to warp over it, or did before the  
4047 Government placed a lock and dam, which gives a slack  
water navigation. I have heard of the Snake river, but  
4048 do not know whether it is navigable or not. If you had  
all the water needed to make the best navigation, I  
would not say you could get up and down a slope over four  
or five feet to the mile. When navigation is accomplished  
over the falls of the Ohio, the river is banked full, with very  
little fall. Going up the river is the hard part. In going over  
the Cumberland Shoals in low water, boats have to be  
4050 warped along. If I were told, even by Government engi-  
neers, that navigation was accomplished on the Snake  
river, in Oregon, over a fall of 29 feet in one mile, I would  
have to be shown the river before I would believe it.

4051 There are a number of dams, wing dams, built in the  
Mississippi river, simply built out from the shore to nar-  
row the stream. In a number of places they have helped the  
river, but the balance they have made worse. Dredges are  
working in the river, but they do not accomplish much, for  
the reason that whatever is dredged out is washed right back  
in again. I believe a 14-foot channel can be made through  
the valley, but not with dredges. I think if they were to wall  
up the banks of the Mississippi river and narrow it in its  
widest place it will dig its own channel.

All the navigation I have participated in is such as has been  
mentioned on the Mississippi, Ohio and Cumberland  
4055 rivers. I have never gone up or down the St. Lawrence  
river, the Columbia or the Snake, nor do I know how  
they are navigated.

I did not say that no boat had ever navigated the Des  
plaines river what I said was that I did not think that  
4057 there ever would be a boat come up or down. The only  
small boat I have had any experience with was a small  
gasoline boat which would, in my judgment, carry less than  
eight tons. I took the boat to Memphis with a small party  
a year ago this spring. With that exception I have  
4058 never had to do with a boat of that sort. I have seen a  
great many boats used in commercial navigation that  
were only capable of carrying about ten tons.

Q. Do you mean boats that are engaged in carrying  
freight?

A. No, sir; pleasure boats.

A boat 12 feet wide, flat bottomed, 60 or 70 feet long, 4059 could carry ten tons of freight on six or seven inches of water.

When I saw the Desplaines river I knew it was a rock bottom stream, because of the boulders that showed in the river.

Boulders would not make the same appearance in a mud 4061 bottom because a mud bottom would deaden the current.

A boat 60 to 70 feet long and 12 feet wide, such as has been described, if operated by steam, could not carry ten tons of freight, because she would be loaded with machinery. 4063 It would take six or eight inches of water to carry her machinery. Well, I said at first, and I will stick to my text, I don't think you could bring a canoe up the Desplaines river.

My record as a navigator and pilot, if I do say it myself, I can prove it, there are few equals and none my superiors.

In the list of boats shown on page 119 of Executive Document No. 264, being a survey of a waterway from Lake Michigan to the Illinois river, I recognize the names of a great many boats with which I am familiar. The depth of the

boats Abner O'Neil, Adam Jacobs, Albert F. Wills, 4067 Alice Brown, Artemus Lamb, E. B. Wood, B. F. Ray,

Bald Eagle, as given in that list, is the depth of the boats empty. As to the Alex Swift, Belle McGowan and Big Kanawha, they are towboats, carry no freight, and the depth given is their depth loaded with coal for their own use. From my examination of this list, the depth given are for the boats empty, except the passenger boats.

*Re-cross Examination.*

4069 In the boats which I have mentioned, where the table gives the length and breadth and depth, in referring to the depth it means the extent to which you can put the shallowest part of your boat down into the water, loaded.

4074 THOMAS F. BOYLE, a witness for the defendant, testified as follows:

*Direct Examination.*

My name is Thomas F. Boyle. I am about sixty years old and live at St. Louis, Missouri. I have been on the river since 1867; got a first class pilot's license in 1871, and have had a master's license for over 25 years. My license covers 4075 from Grafton to St. Louis and New Orleans; the Ohio river to Paducah, the Ouachita river and its tributaries and the Arkansas river to Little Rock. I piloted for ten years during the cotton seasons on the Arkansas river, before they built the railroad. During the summer season there was not enough water to run a boat. I have been on the highest boat that ever left New Orleans, and I have been on the smallest 4077 of them. The Arkansas river is the toughest river on earth, the worst of them all. I piloted a big boat on that river, and when there was not enough water for it, I piloted a small one. The lightest boat I ever piloted on that river does not draw over 18 inches. I know the John H. Harbin. It is a very small boat; does not draw over 12 inches.

I saw the Desplaines river once last April, and again this morning with Captain McCullough; saw it from Joliet 4078 down to the mouth. It has a rough bottom, as far as I can understand; it is crooked, and no boat on earth, of any size, or any account, would ever attempt or no fellow would ever attempt to go up in it.

4079 Q. In your opinion is it or is it not a navigable stream?

Objection; overruled; exception.

A. It is not a navigable stream.

It could not now be used for useful commercial purposes.

Q. Assuming that over 400,000 cubic feet a second of water has been added to its natural condition, what would you say as to whether in its natural condition it was navigable?

Objection; overruled; exception.

A. I think if it dropped down a little there would be no water in there at all.

COUNSEL FOR DEFENDANT. I meant per minute when I said per second.

4080 The smallest boats that I have known navigated could not be taken up the Desplaines river. I am familiar with

the process of warping. I have never done any of it, but have seen a good deal of it, and could do it if I had to.

Q. Could a boat be warped up by Treat's Island on this river?

A. I don't think so.

Q. Why not?

COUNSEL FOR COMPLAINANT. Just a minute, your Honor. I move to exclude the last question and answer. It was answered so promptly I did not get time to object—on the ground that this witness has not qualified for that kind of an answer. He says he never did any of it in his life.

COUNSEL FOR DEFENDANT. He says he has seen it done and could do it himself.

The COURT. It may stand.

It would wear the bottom off of a boat to warp it up either of the channels at Treat's Island, because they are so narrow and crooked. You cannot warp a boat up a stream no wider than the boat is long; you could not get men enough to do it, line enough, power enough to do it. I saw obstructions in the river, consisting of snags, logs, bars and the rock bottom itself. I think you could not see the logs; they were under the breaks. We call that a break when you don't see it; that is a break in the water.

*Cross-Examination.*

4082 Of course the Desplaines could be made navigable, but  
it would take a great amount of money to do it. I cannot  
give any idea of what the greatest slope is that I  
4086 have ever navigated. I have never had any experience  
on any rivers except these central rivers here, such as I  
4087 have named. I have never been on the St. Lawrence,  
the Fox, or any of the New England rivers. I do not  
know whether a boat could be run on a river that had a fall  
of 16 feet to the mile, or one that had a fall of 10 feet to  
the mile. I have had no experience with reference to  
4088 that. The Arkansas river is pretty narrow. In some  
places it is so narrow that in low water you have to get a  
yawl down and go ahead and tow it. The river at those  
4089 places is from a quarter of a mile to an eighth of a mile  
wide. The navigable part was about 40 feet wide. There  
are times when this boat the John H. Harbin cannot go up

the river. That boat only draws about 12 inches light.  
4090 You can load her down about between four to four and a  
half feet. The boat is about 150 or 160 feet long and  
about 30 feet beam. That is the smallest boat I ever saw on  
the Arkansas river. Below St. Louis the current in the  
4091 Mississippi river runs between six and seven miles an  
hour. I think a boat can be navigated in a greater cur-  
rent, depending on the power of the boat. My boat can go  
against a ten-mile current, but I have no idea how many  
feet per mile of slope would produce that current. From  
4092 my view of the Desplaines the other day, I do not think  
there was over three and a half feet of water at the  
4093 shoalest place. I could not tell how many cubic feet  
of water in the river passed at any one place.

*Re-direct Examination.*

4094 There is no place below Grafton that I know of where  
there is a ten-mile current in the Mississippi; the cur-  
rent of that river averages about two and a half miles an  
hour. I might have navigated water at ten miles an hour, but  
I don't know.

JOSEPH E. McCULLOUGH, recalled:

4095 In the navigation of swift waters, the depth of the  
water affects the possibilities of navigating such waters.  
For instance, in the Mississippi river, at flood time, of course  
the current is greater, at medium tide it is very much less,  
and when the river gets low, when it confines the current to  
small places, between bars and shoals, it is a great deal  
4096 greater then, but I would say the average current in the  
Mississippi at medium stage would not be over two and  
a half to three miles an hour. If a steamboat comes up out  
of very deep water onto very shallow water, a stern wheel  
boat especially, she will pull the water right out from under  
her, and sit right down on it and just simply quit going at all.  
If she came up out of 12 feet of water into six, you  
4097 would think she would stop. A sidewheel boat will do  
the same. In shoal water such a boat will not stem at  
all; she will throw the water right out from under her, and  
will not steer. The highest current that is navigable in shoal  
water would not be over four and a half to five mile current.



*Cross-Examination.*

4098 The speed of the boat is a very important factor in determining whether a boat can go up shallow streams with rapid currents, because the more rapidly you turn the wheels, the more water will be thrown out from under.

ISAAC N. MASON, a witness for the defendant, testified as follows:

*Direct Examination.*

4203 My name is Isaac N. Mason. I am in my 78th year.

My home is in St. Louis, Missouri, where I have lived going on forty-six years. My occupation is that of steamboating, which I began on the Monongahela river in 1846. I commenced as second clerk on the steamer Consul, and then 4204 was first clerk up to 1850 and in 1850 I took charge of a boat running from Pittsburg to Cincinnati and Louisville and then I commenced boating from Pittsburg to St. Louis, run in the Pittsburg and St. Louis trade for several years, then I steamboated from St. Louis to St. Paul several years, one year on the Missouri river. Then I was freight agent for the Northern Line to St. Paul for seven years, then I got into politics as Marshall, Sheriff, and City Auditor at St. Louis. After 12 years I went back to the river and was President of the Anchor Line running from St. Louis to New Orleans for over ten years. That was a line composed of nine large steamers. In the last employment I did not have to have captain's papers, but had them before that time. I never held a pilot's license, but have piloted. I have navigated the falls in the Ohio river, the Des Moines and Rock Island Rapids on the Mississippi, and the Missouri river 4205 from St. Louis to Council Bluffs. Since I ceased to run actively on the river I have kept in touch with river conditions, and have been interested in the problem of deep water communication on the rivers for forty odd years. For the last five years I have been one of the vice presidents of the Upper Mississippi Association, an association interested in that matter, and have given time and study to the problem of deep waterway navigation on the river. In 1892 I was president of the Merchants' Exchange and held an official position on the Board of Trade of St. Louis.

4206 I have seen the Desplaines river, I went down it five weeks ago and I was down to-day (June 4, 1908), from

Joliet to the mouth of the river,—where the coffer-dam is being built. Seeing the river at its stage on both visits, I discovered here and there there were pools of water, the water was slack and then between the pools there was rapid current, indicating that the bottom of the river was rocky, uneven; the current of the water always shows the condition to a certain extent, of the bottom of the river.

4207 Q. Will you state from your observation whether or not in your opinion the Desplaines river from Joliet to its mouth, is a navigable stream?

COUNSEL FOR COMPLAINANT. I object.

The COURT. Overruled.

Exception.

A. The Desplaines river is not navigable and could not be made navigable unless it was slack watered with locks and dams. It would not be navigable for any character of boat used in commerce that I have ever been acquainted with in river navigation unless it was improved with locks and dams.

*Cross-Examination.*

4208 I came up from St. Louis on the Chicago & Alton road, got off at Joliet this morning, drove in a buggy to the site of the dam, and back six or seven miles to Minooka, where I took a train for Chicago. We drove 25 or 30 miles. I had a good view of the Desplaines practically all the way down, except that here and there were forest trees that hid the view. We went through a little village, I do not know whether it was Channahon or not, and did not cross the  
4213 river until we came back. When we landed at the mouth of the river we were on the right hand side of the coffer-dam, that is, on the same side of the Desplaines river as that portion of the coffer-dam that is being built,—next to the canal. In coming down we drove along the towpath of the canal for several miles, and forded a river just before we took that towpath, but I do not know what river it was.

The first four years of my experience on rivers was running from Pittsburg to Brownsville, sixty miles up the Monongahela river. I was first and second clerk, and had nothing  
4214 to do with navigating the boat. After that I was second clerk, clerk, and captain on the Ohio river from Pittsburg to Nashville, Tennessee. The service which I rendered then was not the navigating part of the boat, but the business part. I used to pilot once in a while, sometimes for two or

three hours, for exercise, but have never had a pilot's license.

4216 After that, I was general freight agent of the Northern Line, running from St. Louis to St. Paul. I had an office on a wharf boat, but had nothing to do with the navigation of the boats. That service lasted over nine years. After that I was city auditor, sheriff, and city and county marshal at St. Louis. In 1883 I went back to the river and was president of the Anchor Line for over ten years. I had charge of the business end of the work, did nothing with the actual navigation. I have had experience as a master,—during the war my boat was in the Government service with General Grant at Vicksburg, and while there they took my boat and loaded her with ordinance and let my pilots go, and when I was released I could only get one pilot and stood watch from Youngs Point to Cincinnati. I consider myself a thoroughly practical steamboat man.

The falls in the Ohio river have a drop of about thirty  
4220 feet in low water, in a distance of less than two miles.

When I was in the St. Louis and St. Paul trade in 1857, 1858, 1859 and 1860, I was commanding the boat. I had  
4224 two pilots, and my business was the business end of the matter. My boat ran up and down the rapids between Rock Island and Moline. At the Rock Island Rapids, the fall is about 18 feet in about 18 miles, so I have been told. I only know from hearsay. The current in the Rock Island Rapids varies. It varies very much in 18 miles; part of it is ten or eleven miles an hour and some of it is probably only two  
4225 or three miles. It is in pools, the rapids is in pools. My

boats passed right up and down through that. The greatest slope I have ever passed over in a boat is the falls, at Louisville, Kentucky, in the Ohio river, where there was a fall of about 30 feet in two miles. The boats passed up and down there only in high water, the current in high water would average from six to eight miles an hour. At high water the falls is covered so you couldn't observe the falls at all. I do not know what the slope in the Desplaines river is, nor

the speed of the current, but should guess it about 7 to  
4226 10 miles an hour. There is places in the Desplaines river where the current is more rapid than it is on the Mississippi river, only for a short distance. I only judge from experience in looking at the Desplaines this morning. It is 43 years since I quit running boats over these rapids in the Mississippi, but I have been over the rapids since that time,

and have studied the matter somewhat in regard to im-  
4228 proving the channel of the Upper Mississippi, especially  
on the rapids,—the Rock Island Rapids. My especial  
interest was to have the Upper Mississippi improved, the  
rapids in low water are very dangerous to navigate, and the  
Government has improved them in such a way they have les-  
sened the danger over 100 per cent. The thing which the as-  
sociation with which I have been identified has been asking,  
is to make deeper water in the upper Mississippi, and what  
the Government has been doing is to build wing dams up  
along Lake Petin, and away up in towards St. Paul, and  
narrow and deepen the stream.

4229 There are no locks and dams in the Cumberland, the  
Tennessee or the Allegheny. I have not been on the  
Cumberland river since 1863, I never went up the Tennessee.  
The only concern I have had in those rivers is to assist the  
men who are steamboating there to get improvements.  
4231 They build wing dams there to narrow and deepen the  
channel. There are no locks and dams on the Allegheny.  
I never was up that river, only to cross it at Pittsburg about  
40 years ago.

*Redirect Examination.*

4233 I got to Joliet this morning about half past five. When  
I went down the Desplaines river the first time, we  
crossed four bridges. In high water in the Ohio river, the  
fall is obliterated, so you can not see any fall in the river, the  
slope varies with the variation of the amount of water. When  
I speak of the slope in a river, I mean when there is a  
4234 boating stage of water, as in the Rock Island falls, when  
there is 6 or 7 feet in the channel. The ability to navi-  
gate slopes depends upon the depth of the water. A captain  
of a steamboat has full charge of all the business connected  
with his boat—I considered myself that I understood the  
duties of a master of a steamboat thoroughly—When I was  
master of a boat, the pilots were under my direction and com-  
mand as captain. My guesses as to the rapidity of the Des-  
plaines are my estimates of the rapidity.

*Recross Examination.*

4240 The pilot is under the captain's control. If the cap-  
tain said to go a certain way, the pilot would be ex-

pected to go the way the captain told him, although that might not be the channel.

L. L. WHEELER, a witness for the defendant, testified as follows:

*Direct Examination.*

My name is L. L. Wheeler. I am 57 years of age, and  
 4287 reside at Sterling, Illinois. I graduated from the University of Michigan in 1874, and have been following the profession of civil engineer ever since. I was connected with the survey for the northern and northwestern lakes, under General C. D. Comstock, for seven years. I was also employed by the Mississippi River Commission in the office at St. Louis, Missouri, for six years, during which time my duties  
 were mainly those of conducting general surveys and  
 4288 preparing data for publication. The Mississippi River Commission was a commission ordered by Congress, consisting of three officers of the Corps of Engineers, one officer of the United States Coast and Geodetic Survey, and three civilian members, having in view the improvement of the navigation of the Mississippi river from the mouth of the Ohio to the Gulf. I had charge of the computing division in the office for a number of years, and prepared the data for the information of the Commission and also for publication. I was not directly connected with any of the field construction of the Commission; I mean by that, with the construction of levees, bank revetment, grading of banks, and so on.  
 4289 After leaving the Commission, I came to Chicago to take charge of the survey for a waterway from the lakes to the Illinois river at La Salle, and during the fall of 1888, and to the fall of 1890, I was engaged upon that work. I made surveys of the country from Bridgeport to Joliet with some special surveys along the Chicago river; made also detached surveys in the vicinity of Treat's Island, Sugar Island, Marseilles, Ottawa and other points along the Illinois river. The result of my work was published in a report and the maps were also printed, as a volume. That survey was made under the Engineering Department of the United States Army, pursuant to authority of Congress. Major W. L. Marshall was the engineer in charge of this district at that time. I am the L. L. Wheeler referred to in Major Marshall's report of that survey, I was engaged in the work approximately two years.

I was assistant engineer, had charge of the field work, 4290 and had occasion during that survey to make surveys of different parts of the Desplaines river. After finishing that work, in the latter part of 1890, I was put in charge of the location and construction of the Illinois and Mississippi Canal, known locally as the Hennepin Canal, by Major W. L. Marshall, who was then in charge of the Engineering 4291 District, and that canal is in the Engineering District of the canal. I have been engaged in that work ever since, nearly eighteen years. I am still connected with the Hennepin Canal, having in charge the care and operation of the whole canal, under, of course, the officer of the Engineering Corps of the United States Army.

The Hennepin Canal leaves the Illinois river near Bureau Junction and runs nearly due west to the Mississippi river at the mouth of Rock river, perhaps three miles below the City of Rock Island. It is supplied with water by a feeder which leaves Rock Island at Sterling, Illinois. The entire length of the canal is 75 miles, the feeder is a little more than 29 miles. The width of the canal prism is approximately eighty feet at the water line, and the depth seven feet.

4292 There have been built a great many miles of earthen embankment in that canal. Quite a good many miles are exposed to the action of water on the outside and others are exposed to water action on the inside. The first section that I built was at the lower rapids of Rock river, near Milan, about opposite Milan, Illinois. At that embankment, when the north embankment has high water, Rock river comes against it throughout its length, four and a half miles practically. For 4,500 feet, however, of that distance, the canal was built by parallel embankments in the bed of the river itself, in which the river was against one embankment on the north side and a large creek, Mill Creek, against the south side at the south embankment. Those embankments were built in 1893 and 1894, and are still standing. There are other places along the canal where the high water from the rivers or streams comes up against the outside of the embankment. The 4293 main body of the embankment consists of earth which was brought out in cars and dumped. The outside and inside slopes are rip-rapped with broken stone, stone as it came from the quarry. The width at the top of the bank was, I believe, twelve feet. The slope of all the banks in the earlier construction was one and one-half horizontal to one vertical, but down in the cross-section—I have a typical cross-



section, and the outer slope of the north embankment is not over two to one horizontal. I could not say to my recollection whether or not that is two horizontal to one vertical. It could not be steeper than one to one-half. The cross-section marked "Wheeler Exhibit One" (Atlas, page 3977; Appendix, page ..... ) and now introduced in evidence, and which purports to be a cross-section of the Hennepin Canal below the mouth of Mill Creek, opposite Milan, Illinois, a point where the canal is built in the bed of the river, with the embankment on either side, correctly represents the situation at that point.

4297 Said map was received in evidence.  
Objection.

The letters and figures "H. W. 135" on the mound on the left on said map means the elevation of the high water in Rock river in reference to Hennepin datum,—135. The line below that, marked "L. W. 126" represents ordinary low water in Rock river referred to the same datum. The water shown at the left of the left embankment, which appears at the left of the exhibit, is the water of Rock river; the water between the two embankments represents the water surface here carrying the exact level in that level of the canal. The "W. S. 131" marked on the top line is the base of the slope surface. The other elevation there shown is the bottom elevation, the elevation at the lock in the bed of the stream.

4298 The letters "W. S." mean water surface.

The right half of the exhibit "H. W." represents high water in Mill Creek, and "L. W." represents low water on that side. I would like to qualify my testimony in regard to those two elevations at that point by saying that the slope of the creek is quite steep, and according as you move up or down stream, usually the low and high water elevations will vary. That is typical of that vicinity, however.

The high water line of the Rock river comes within three feet of the top of the embankment, and the high water line of Mill Creek, on the right of the exhibit, is shown as two feet from the top. Mill Creek is a stream whose greatest area lies mainly in a country of deep slopes. At low water it is practically dry, and at times of heavy rains, it comes out with torrential force. The measurements that we made while engaged upon that work show that the maximum flood might be expected of ten thousand cubic feet a second, and the slopes are so steep in the drainage area that floods



of that volume might be expected from perhaps five to eight hours after the rainfall.

COUNSEL FOR DEFENDANT. How wide is that creek between banks?

COUNSEL FOR COMPLAINANT. I object to it, your Honor, as being irrelevant and unimportant.

The COURT. He may answer.

A. The width would vary. Some places it is quite narrow, but I would say generally from fifty to one hundred feet. In places it overspreads the adjacent country.

COUNSEL FOR DEFENDANT. What is the size of Rock river at that point, its width and depth?

4300 Objected to as incompetent; overruled.

A. It is a large stream at this particular point. It is divided into two channels, by islands. The channel on the south side at that point represented by the cross-section, would be perhaps 800 or 900 feet wide, and the channel on the other side perhaps 400 to 500 feet.

COUNSEL FOR DEFENDANT. What is the usual depth of water in that river at that point?

Objection; overruled.

A. That is situated on rapids, and at times the rapids are entirely backed out by high water from the Mississippi so that there is a considerable depth of water there. In times of flood there is considerable depth, but in ordinary stages the water is quite shoal, perhaps from one to two feet in

4301 that vicinity. In times of high water, there is perhaps nine or ten feet of water against the bank there. The maximum flood in the Rock river at that point I have estimated as 65,000 cubic feet per second. I suppose the maximum discharge of the Desplaines river at Joliet is approximately 13,000 to 15,000 cubic feet per second.

The two earthen embankments which were constructed at this point, opposite Milan, Illinois, were constructed of earth excavated immediately above on the south shore of Rock river and the earth consisted of black sticky prairie soil, underlaid by yellowish clay, and underneath that some gravel and boulders lying on top of limestock rock. The earth was loaded on cars and the embankment built with it, the stone used to riprap the outside of the embankment, and the embankment generally on that section of the canal. The stone, I think, came from the quarry, and was dumped from cars on the slope; it

4302 was not placed by hand at all, either on the outside and inside slope, on each side of the embankment.

COUNSEL FOR DEFENDANT. How does the material of which these embankments of the Hennepin canal are constructed compare as to durability and impermeability with the material of which the towpath bank is constructed at Dresden Heights?

Objection overruled.

I should say that the material of which the towpath of the Illinois and Michigan Canal is constructed, for three or 4303 four miles above the works at Dresden Heights, is of better material for a water tight embankment than the material used in this embankment in the river at Milan. I have inspected the material in the towpath bank at Dresden Heights. I know there has been no impairment of those embankments. They stand to-day as they were left fourteen years ago. I saw them last Saturday. Muskrats or other vermin have not committed any depredations so as to impair them.

4304 The rip-rapping done upon these embankments in the Hennepin Canal near Milan was loose stone dumped on the slope. In my opinion rip-rapping which consists of stones of various sizes dumped on an embankment, furnishes a much better protection against the wave wash and other action of water, than of stone of comparatively uniform size laid by hand, in a way that is commonly termed "sloped paving." In case there is any washing away of the material underneath, the loose stone settle down at once and remedy the trouble, and in "slope paving" it often happens that the waves will run up the slope by the winds, go through the interstices and, coming back through the material underneath, bring it out at the foot of the slope. At Lincoln Park the slope paving is one example of that. I have had several examples of that on my own work where slopes in front of bridge abutments were paved in that way and difficulty has developed; but where the slopes have been protected with loose stones, dumped haphazard upon the bank, very little trouble is experienced. On the feeder of the canal, 22 miles on one side and 19 miles on the other have been protected by rip-rapping in that way. Of the four and a half miles of canal at Milan the outer river slope and the outer slope adjacent to the creek, and a 4306 large part of the inner slope of the canal were protected in that way and the protection has stood there 13 or 14 years without any damage. It is on what I have actually observed that I base my opinion that the loosely dumped stone,

rip-rapped, forms a better protection against the action of the water than the so-called "slope paving."

I have been at Dresden Heights since the proposed dam of the Economy Light & Power Company was commenced, was there in April this year. I somewhat examined the towpath bank of the canal above the dam, drove along it from Channahon down to near the site of the works and walked the remaining distance along the towpath. In quite a number of places I examined the inside slope of the bank, in the canal. I observed the work that had been started by the Economy Light & Power Company. I noticed a berm on the inside slope of the bank. I judged from its appearance it was formed partly by the action of the water washing the bank away, and partly by the bumping of rip-rapping and stone which was below the water surface at the time I was there. The rip-rapping below the water line I could not see, but I used a stick and found stone beneath the surface of the water. There was work there recently dumped on that berm for a considerable distance above the power station. I had no means of telling whether it encroached below the water surface, but this line at the water surface would indicate that it did not encroach upon the prism. At one place they had encroached to a little extent to obtain the foundation or support for a hoisting engine. I suppose it was temporary, I should say it went out 5 or 6 feet into the water line, perhaps 15 or 20 feet long.

Q. I show you two blue prints, one that has been marked "Cooley Exhibit 28," one that is marked "Plan of Dam May 20, 1908," purporting to represent some construction work here,—have you examined that?

A. I have seen both these plans and was furnished with a copy of this one marked "Cooley Exhibit No. 28."

Q. If a pool of water should be formed by the construction of the dam and works,—in the Desplaines River, shown upon these two blue prints, in the manner here shown, at the point where you have seen the commencement of work at Dresden Heights, what effect, if any, in your judgment, would that pool have upon the towpath bank against which it would flow?

4312 A. One effect of raising a pool of water against the outside of the embankment would be to reduce the hydrostatic head upon that embankment by the amount of the water raised up against the bank of the embankment. Another effect would be that the action of the waves might, and probably would, in time, eat into the embankment a certain

distance. One of these changes would be to make the bank more safe, and one would be to make it more unsafe.

The term "hydrostatic head" is used to express the pressure of water in a quiescent state, and the measure of that pressure would be the difference in level between the water on two sides of any partition. At present at low water  
4313 the top of that embankment generally is dry and the effective pressure is that due to the difference between the level of the ground at that place and the water level in the canal. If the water on the outside was brought up to the level of the water on the inside, then there would be no pressure upon the canal embankment, tending to displace or destroy it.

I believe that it would be entirely feasible and practicable within a moderate limit of cost to protect that embankment from any injury which might result from the formation of such a pool, by simply rip-rapping stone upon the opposite slope, at such time and places as time showed as necessary.

Part of that bank is already rip-rapped on the outside in places, probably that rip-rapping would be sufficient. Where the embankment is immediately adjacent to the river bed rip-rapping would be needed sooner than in the upper portions where it is not immediately adjacent. The outer bank is quite well protected by trees and brush now. In my judgment the proper thing to do would be to let time tell how far up it would be necessary to continue the rip-rapping. The wave action on that embankment I feel satisfied would be very slow.

4315 I noticed there were quite a number of animals digging holes into it and bringing material out. I suppose they were woodchucks. I don't remember seeing any crawfish, I presume they were there; I don't remember seeing any muskrats, or indications. The formation of the pool would prevent the depredations of woodchucks below the pool level. I suppose that muskrats would endeavor to burrow along if they found a suitable place. Rip-rapping is a pretty thorough protection against rats. It would be feasible and practicable to maintain the bank, after rip-rapping, against muskrats.

The bank would be saturated of course, below the pool  
4316 level. The saturation line that would be dangerous to an embankment, would be that from a higher head of water. Experiments have shown that there is a saturation line in embankments descending from the water level down

through the embankment, and it is considered that the dimensions of embankments should be such that it always covers the saturation line. In that particular case, it would be the saturation line from the inside, which would be an element of danger, and that would not be changed as I can see by the raising of the pool on the outside. In my opinion, the formation of the pool at this point by the work shown upon these different blue prints would not cause saturation which would give any more element of danger, if it were rip-rapped in the manner in which I have described, than that cause.

4317 I remember the Adams Dam in Joliet. It was in existence when I was making the survey in 1888 to 1890. I am somewhat familiar with the conditions which existed at the point where that dam was, and the condition of the river and the canal bank.

COUNSEL FOR DEFENDANT. Will you state briefly what were the conditions there with reference to the embankment being flowed on one side by the river and on the other side by the canal, if you know?

Objection.

A. I recollect the Adams Dam, and the way it came over towards the canal bank; I have no recollection, if I ever knew, and I do not just remember how the Adams Dam connected over on that side. I was under the impression that there was some structure in there.

COUNSEL FOR DEFENDANT. Assume, colonel, that this map which I show you, and which I will mark Woerman Exhibit, June 8th (Atlas, 3978; Appendix, page .....), shows a correct representation of the cross-section of the embankment at the point where the Adams Dam was; and assume, also, that the other cross-section at the point where the proposed dam is being constructed is correctly represented; and state whether or not in your judgment there is any greater danger to the canal bank at the point where the Adams Dam was by reason of the water in the river flowing up against the bank than there would be to the towpath bank near Dresden Heights if this pool should be formed by the construction of the Adams Dam.

COUNSEL FOR COMPLAINANT. I object, because the exhibit and the assumption to which his attention are directed start with that proof; and, secondly, if proved are silent on the points of difficulty and do not convey the information as to the controlling condition.

The COURT. He may answer.

4320 A. I should say that there is no material difference in the danger from the river itself on that side. The embankment as proposed at the site of the proposed work has a wider base than the other, which would be an element of safety; but from the action of the river itself I could not say that there would be any particular difference between the two. I don't recollect that I noticed whether the bank at the point where the Adams Dam was had been impaired in any way by the action of the water in the river at the time that I saw it. I do not remember that the embankment had a vertical wall on the canal side.

I am familiar, to a limited extent only, with the high water conditions of the Desplaines River,—not since the waters of the Sanitary District have been turned down the channel. Prior to that, and during my surveys, I made investigations in regard to that matter. In my opinion, the pool formed by the construction of this dam could be adequately controlled by the gate shown upon the blue print which I have examined, and by the spillway and general construction there, so that the canal bank would not be overflowed, and, in my opinion, the plans there provide for a sufficient control of any maximum flood likely to occur in that river.

4321 COUNSEL FOR DEFENDANT. In your judgment, would there be any necessity for the adequate protection of the canal bank to pave the top of the towpath bank or pave the inside of the bank?

Objected to as leading and suggestive. Overruled as directly and specifically rebuttal.

A. I do not believe it would be necessary to pave the towpath on the upper surface; the only reason for paving it would be to care for the travel over it of teams and vehicles, and the material of which it is composed is already firm, good, solid material, and make a fair roadbed surface now.

I am familiar with the old Kankakee feeder that crossed the river above the point where this dam is to be constructed, I have been there and been a short distance up the feeder, perhaps a mile and a half, or such a matter. I have made an approximate estimate of the cost of the reconstruction of that feeder as a navigable feeder, and the connection with a reconstruction of the aqueduct across the river, entering the canal, also an approximate estimate of the cost of reconstructing the feeder, with a connection between the south side of the river and the canal by an inverted siphon



and guard locks for navigation across the pool of water that would be formed by the construction of this dam.

COUNSEL FOR DEFENDANT. How do these estimates compare?

Objected to as irrelevant, incompetent and immaterial, and because there is no foundation for it in the testimony of this witness; overruled.

4323 A. I estimate that for the purpose of carrying navigation across the river on the level of the present feeder, the building of the aqueduct, including new concrete piers, steel trusses and floor system, and reinforced concrete sides and bottom, would cost approximately \$65,000. The cost of the necessary guard locks on the north side of the river will cost \$10,000, making a total cost of \$75,000. Under the alternate project of carrying navigation across the river and supplying the canal with water through an inverted siphon under the river, the cost would be as follows: Pipe, 6 feet in diameter, 752 feet long, would cost \$4,904; excavation for placing this pipe, 1,800 cubic yards at \$2.00 per cubic yard, \$3,600; coffer-dam and necessary pumping, I estimate would cost \$10,000; two locks, one on each side of the river at \$20,000 each, \$40,000; making a total cost of that project of \$58,504.

I have had occasion to construct inverted siphons and  
4324 guard locks in my work, and am sufficiently familiar with all kinds of work in those estimates to say that they are approximately correct. I do not believe there would be any difficulty in feeding the Illinois and Michigan Canal through an inverted siphon from the Kankakee River, by an inverted siphon placed under this pool of water which would be formed by the dam at Dresden Heights. Both at the present time, and after the construction of the proposed dam it would be safer construction to carry the water through in a pipe and have two locks on the shores. I am sure there is depth of water enough in the river now for that, for the depth of navigation carried in the Illinois and Michigan canal. That would be the safer construction and probably cheaper. If, however, the pool had to be raised, it would be very much preferred.

COUNSEL FOR COMPLAINANT. It is understood, your Honor, that this entire proposed project for fitting up a new—is objected to.

The COURT. Yes.

COUNSEL FOR COMPLAINANT. It won't be necessary for me to repeat it.



The COURT. No.

4325 A. I do not believe it would be possible to build an aqueduct across the river there at the present time before the formation of this pool without interfering with navigation on the river, except for boats low enough to pass under it. I do not believe it would be possible for any boat to pass under the aqueduct, the aqueduct reconstructed across there as it was before it was abandoned during high water stages of the river.

Q. How familiar did you become with the river, the Desplaines River, during the two years which you were engaged in the making of the surveys under Captain Marshall?

A. In that portion of the river above Joliet, up to Summit, I have been along that many times, camped along there  
4326 while surveys were in progress. Below Joliet I went down a number of times, went through the river in a skiff, and have also been down the canal in a boat,—that was in the fall of 1888 and during the summer of 1889. During the fall of 1888 the river was very low and my men and myself crossed the river back and forth below Sag Bridge, a short distance below. Above that point there was considerable of a pool and we had to either cross on the bridges or use boats. In the spring of the following year there was a considerable flood in the river. I do not remember that I was below Sag Bridge during that period. Below Sag Bridge, we crossed a number of places by simply going from stone to stone, without having gotten in the water to get our feet wet.

Q. How long a stretch of the river was it that you did that in?

A. I think that we had shoal places here and there, ripples, that we went across on. One place was near the present site of the controlling works of the Sanitary District. The river was very shoal there, very little water flowing that fall in the Desplaines River. I saw other portions of that region  
4327 in flood the following spring. I had parties in the field, but I do not remember that I ever saw the portion in the vicinity of Lockport in flood. I was down the Desplaines from Joliet to the mouth a number of times during the years 1888 to 1890 inclusive. I passed through the river in a skiff. I purchased a skiff in Joliet and took it down below the Adams Dam, went in the canal, then hauled over the canal embankment into the river and passed down the river as far as a Salle. There were with me two men and a small boy,—besides myself. In same places part of the crew were put

ashore to let the skiff over the rapids. We had to drag the skiff to get over the rapids. There was one place soon after we went into the river that we were aground, and we fooled around and managed to get out at the head of Treat's Island. We ran onto boulders and partly capsized, and found other places with pretty swift water; pretty swift water in the vicinity of the present works at Dresden Heights.

4328 I did not observe the rapids at a place called Smith's Bridge. The river was rapid at the mouth, but I do not remember of having seen boulders at that place. At Brandon's Bridge there seemed to be several channels and gravel bars, the bed of the stream apparently composed of gravel and boulders, and we worked our boat through those until we got down to Lake Joliet. That trip was made some time in the month of July; I could not fix the exact date. The Bridgeport Pumping Works were in operation at that time, but I

do not know how much water they were discharging into 4329 the Desplaines River at that time. There were rapids for a little distance below the mouth of the Desplaines River, I don't remember any difficulty in navigating them in my skiff,—we camped on the south shore when we had reached the foot of the rapids. I went down there in that vicinity several times, at other seasons during those two years. I have had some experience in connection with my engineering work in the navigation of boats, on the Rock River, also some on the Mississippi River and some on the Illinois River.

Q. State whether, in your opinion, the Desplaines River was capable at the time you saw it, or during the two years in which you became familiar with it—was capable of any season of the year of being used for useful purposes of commerce.

COUNSEL FOR COMPLAINANT. I object. It calls for irrelevant, incompetent and immaterial matters, for which no foundation has been laid.

The COURT. He may answer.

4330 A. I should say that it was not navigable for commerce carried in boats. It might have been used in times of higher stages for floating logs or timbers down stream; nothing very well could come up stream. I am not very familiar with the Desplaines since the draining flow has been turned in. I have crossed it at Joliet and been down to Dresden Heights. I think the river would not be capable of practical navigation as it was during the two years I saw it in 1888 and 1890 for two reasons, first, on account of the low,

small volume of the discharge, and second, on account of the steep slopes at places. The high water season or wet season in this river, from my knowledge of it, is very short, that is that the maximum at the high stage would not last more than a couple of days, something like that. The course of 4331 the stream between Joliet and the mouth was quite crooked in places. I do not recollect that it would have been so crooked as to interfere with navigation.

The maps that were made of the Desplaines River that were published in connection with the Marshall report, were made under my direction in my office.

Q. Colonel Wheeler, state whether or not in your opinion the Desplaines River was capable of navigation for useful purposes of commerce, or would have been capable of such navigation even if dams had not been in the river?

Counsel for complainant objected on account of lack of qualification on the part of the witness, and irrelevant, incompetent and immaterial.

The COURT. He may answer.

A. In my opinion it would not have been navigable on account of the steep slope.

I have some familiarity with the effect of wave wash on embankments.

Q. State whether or not if this canal bank above the site of the proposed dam were riprapped, properly riprapped—state whether or not the wave wash caused by the wind 4334 on the pool to be formed by the construction of this dam, or caused by the action of boats in navigating that pool, would have any injurious effect upon the bank?

A. My understanding of that question is that if the bank is properly riprapped, will there be harmful action due to wave wash or wash from steamers?

Q. Yes.

A. I should say not.

COUNSEL FOR DEFENDANT. That is all.

*Cross-Examination.*

4335 As to whether I was the man in immediate charge of the construction of the Illinois and Mississippi Canal, ordinarily called the Hennepin Canal, I have been in charge of the construction of a large part of it, been at work on that from the time it began, now am in charge of the operation and care of the whole canal. Yesterday, I said where its ter-

mini were, and where the feeder started from in the Rock River. The canal leaves the Illinois River near the station at Bureau Junction on the Rock Island road and extends nearly westward to the Mississippi River, at the mouth of Rock River, a distance of 75 miles. The summit level of that canal is north of Sheffield and the summit level is supplied with water from the Rock River at Sterling by means of a navigable feeder 29 miles long. The feeder and the main line of the canal are of the same dimensions, 80 feet wide on the water line with 7 feet depth of water. The locks have chambers 35 feet wide, and 170 long. I commenced the location for the construction in November, 1890, at Milan, but on account of some legal difficulties the actual construction was not commenced until in 1892. There is some work to do on it to finish it. It was so far finished that it was opened for navigation last fall, October, 1907.

Q. Do you remember a report made to Congress about 1895 in which the engineers stated that at the rate of progress which was being made on that work the first half would have gone to decay before the last half would have been completed and the work opened for use?

A. I cannot say that I remember such a statement in the report, but I have known of such a statement being made.

4337 The banks are imperishable material. That was damaged due to storms and rains, and was not for any excessive amount. At that time, however, the rate of progress upon the canal was very slow on account of the failure of Congress to appropriate the money for its construction.

4340 As to whether it is not a fact that the canal banks of the Hennepin Canal did suffer from attacks of vermin very greatly during the construction of the canal, a great many burrowing animals made their home along the right of way and no systematic effort was made to drive them out until last year, when we approached the time when we were ready to turn water in the canal. Then a very systematic campaign was waged against them during the last year, and they were killed in large numbers. A considerable sum of money was expended in exterminating them and taking their holes out, but it did not delay the opening of the canal in any way. I mean that I got at the work of restoring the banks long enough before the time for opening so that I had

4341 the restoration done by the time for opening arrived. I had several serious difficulties, but that was a precau-

tion which we found it necessary and advisable to take, to examine the banks throughout the whole length, and wherever burrowing animals were found in them, to kill them and take the holes out. It is a fact that the muskrats in their depredations work in the immediate vicinity just above and below the water line where the water attacks a bank. I would not say that is also true of crawfish. I never saw crawfish holes of from two to two and a half and even four and five inches in diameter, and sometimes from two to four feet long into an earthen embankment, so that those holes will be partly below and partly above the water line.

I think I have seen a crawfish hole two inches in diameter. I doubt if I have seen one three inches in diameter. As to a crawfish hole two feet long, I have no doubt that many of them are even deeper than that. I would not say four feet long, but I do know that they go down in the ground quite a distance. I haven't much doubt that they frequently make holes four feet long. Well, the crawfish holes that I have seen are vertical. The object of the animal is to go from the surface of the ground down to where he finds water. I suppose he will keep going until he gets it. As to it being a place of lodgment for them to run, and that they go by a slanting line with a minimum depth, I don't know that. The dimensions I would give for the crawfish mounds that I am personally familiar with would be about, perhaps, six or seven inches high, and two inches in thickness surrounding the holes, and possibly more than that.

The line of the Hennepin Canal lies in the bed of the Rock River, opposite Milan, about 4,500 feet. It goes into Big Island and then goes down through Big Island to the mouth of Rock River. Rock River just at Milan divides into two main branches which form two sides of a large triangular island, of which the Mississippi forms the third side, and that island, of some several thousand acres of land, is called Big Island. There are three or four other small islands, I would not say at the head of this island, but they lie over north of the upper end of Big Island, and extend up stream perhaps two miles, or nearly that, a mile and a half.

Black Hawk's watch tower overshadows as we go down on the north side of the river just opposite this 4,500 feet. Black Hawk Tower is on the north shore bluff, and from that this work can be seen in the river-bed. Black Hawk's watch tower,

I don't recollect the height, I haven't measured it, I should say is perhaps 125 feet above the water. For a short distance up stream, the bluffs recede from the shore line of the river and the bluffs terminate a very short distance below Black Hawk Tower.

There are immediately adjacent to the river for perhaps three-quarters of a mile, lofty bluffs, and then further back with farms lying between the foot of the bluffs and the river. From the river when you get up as far as the Moline bridge, they are much more than 80 rods, and on the south side of the river, the bluffs are from half a mile to a mile away from the river, with a broad bottom land on the south side of Rock River between the river and the bluffs. At the vicinity of this work, for several miles along there, Mill Creek comes down through and floods the broad bottom lands over a mile wide on the south side of the river. It comes in from the south side, but not through marsh lands, and it is not a small creek. It comes through about a mile of bottom land, which, however, is not level. There is a fall of about 20 feet in that mile, that is from the bluff road that skirts the edge of the bluff on the south side of the bottom lands. There is a broad space of bottom land on the south side. Immediately abreast of that on the north side, is where the bluffs terminate, and adjacent—that is where they terminate as to the shore of Rock River, and the river flows straight west from the east to a bed of solid rock, and the river divides out between Milan and Searstown; so that, while it has got these two main branches, it also has several minor channels which enclose Vandruff's Island and the other small islands, and there is no water power dam at Milan at the present time. There was one before I began work, which had been built by the Rock River Water Power & Navigation Company, and which had been washed out. I could not fix the year it was destroyed. I believe it was nearly destroyed at the time I made the survey. I think when I first went there, they were still using some power from it, and by the year 1894 it had been entirely washed out. Perhaps I should correct that; I would not say entirely washed out, but washed out enough so that it did not yield any power.

The Rock River Water Power & Navigation Company had constructed a small canal on the Searstown side of the river long before I began work as a part of that water power and



navigation work. I did not interfere with that in any  
4350 way. The location was on the south side of the river,  
and the river runs straight west from the east, for a distance of some five miles there. These two dikes referred to were built lengthwise in the Rock River near the south side of Rock River running parallel with the bank of the river and with the current of the stream, and there was no dam at their foot that had to be calculated for in the construction of these dikes. There is none now, and they run down into Big Island and the canal is extended right straight down through Big Island to the Mississippi River.

I was last at Dresden Heights some time in April of this year. I was there one day only. I started from Chicago to go that morning to Dresden Heights. I went to  
4351 Minooka by rail. I think we left the depot here about seven o'clock, or shortly after, and arrived there shortly after eight. I may be mistaken in that, but it was in the morning between eight and nine o'clock. Then I took a carriage from Minooka. We drove to Channahon and then on to the canal towpath and thence down to the house just about this work in progress. The length of time it took to drive over there was,

I should say, somewhere near an hour and a half. We  
4352 stopped at quite a number of points along the canal embankment. I came back the same day by the same method, got home to supper in Chicago, between six or seven o'clock. We were at and around Dresden Heights a portion of the day, taking so much as was necessary of the forenoon to get down there and so much as was necessary of the afternoon to get back. Mr. J. W. Woerman and Mr. T. D. Johnson were with me, nobody else. I have not been there since. I had been there before. I had been down to Dresden Heights in 1888 and 1889 when I was making this survey.

4353 I had not been there between those times. Then my knowledge of the situation down there so far as it is derived from personal observation was derived in this portion of the day in April when I made this trip, together with my observations that I made there in 1888 and 1889. My knowledge of any recent work was derived from my observation on that one day, and a study of the plans together. I had access to the plans, and made some study of them in connection with my observations.

Q. In your answer about this work, you have taken into account what you learned from that examination and from



your study of the plans as well as what you learned from  
4354 your personal observations on that day?

A. Yes, sir.

Objected to because the questions were based merely upon two blueprints that were handed to the witness and his answer stated that they were based on them.

COUNSEL FOR DEFENDANT. I understood the form of that question—the objection was sustained to the form, the court saying that he could ask the witness what his answers were based upon.

The COURT. No, he don't have to ask him directly. He may ask him indirectly on cross-examination.

COUNSEL FOR COMPLAINANT. Q. You say, Mr. Wheeler, that you poked around with a stick down there?

The WITNESS. Referring to the picture that was shown me in the direct, Woerman Exhibit, June 8th, I think I said I could not see what was under the water. I don't think I said that I could not say what was under the water, because I was positive that it was stone. As far as I could poke with  
4355 a stick in places, the water was not transparent. I poked around with a stick here and there at points where I was walking along and the berm offered an opportunity for me to step down; some places there were stones that I could step on. There was no effort made to examine the whole length from Channahon down, but only at occasional points. We got out of the carriage several times going down there, and then we left the carriage at that locktender's house and walked from there to the site of the work. We got out several  
4356 times, more particularly to examine the back of the bank, when we were in the carriage. When I speak of the back of the bank, I mean the side towards the river. Before I got down to the locktender's house, I don't remember for sure whether I made that kind of an examination at times when I got out from the carriage. I know that I did several places afterwards. I did at several points, after I left the towpath walker's house, poke with my stick down into the canal water and feel the stones. I would not say twenty times, very considerably less than that. Perhaps half  
4357 a dozen times where the berm afforded a footing for me to go down on it and make that exploration. The berm on that day was mainly out of water. It was a nearly horizontal shelf. In some places where this recent work had been in progress it was covered with stone slanting upward to the top. I did not make an examination at those points.

My examination was made where there had not been any stone filled in on the berm. Whether that berm was one which had been constructed as a part of the original construction of the canal, or had been formed by the operation of nature upon the banks after it was left from the different natural forces, waves, wave wash, frosts, rains, weather, I could not say positively, but I judged from the appearance that it had been formed through the action of the elements.

I will qualify that. Its width might have been increased 4358 by stone dumped on the inside below that level, but the appearance was what we call a natural berm as distinguished from an artificial berm, meaning by natural berm, one that has been made in the process of time. With a bank which is not furnished with artificial berms in the construction to start with, or with artificial protection to prevent berms, there will form a berm by natural operation of the water in the banks of the canal, and the berm would take the form of the berm that you found down there, and that you would find here on this Woerman Exhibit of June 8th, if that pink paint on the canal side and the stone that represented by it were not there.

4359 There would be a horizontal shelf there nearly at the water line edge, and the material which had been formed in the slope out of the operation of the waves and other natural causes would have gradually slid down the bank to the bottom of the canal. I would not say necessarily that it would slide down to the bottom, but slide down part way. It would be stretched along down the slope below the water, and in process of time would make an indentation in the bank at the point where the berm is and the filling in there below that point. That is the natural operation of the water on any such bank, and that would be the tendency of this bank. And that would go on until the berm had gone in deep enough and the slope below had become low enough so that the material would then cease to slide. It would reach a position of equilibrium, probably in time, and I found some places along that canal where this berm projected out between five and six feet.

4360 The dimensions of the Illinois and Michigan Canal at that point are 60 feet water line and 6 feet deep. It may be silted up very much for all that I know, but that is the standard dimensions fixed for that work. I think 6 feet deep is the depth on the miter sills, indicated to us now. I don't know how deep it was there. For any given depth of water

I can tell you what the hydrostatic pressure is, but it does not depend upon the width of the stream. It makes a  
4361 difference whether you ask at the top of the slope or  
at the bottom of the slope. If you were at the water  
line there would be no pressure, and as you went down and  
the depth increased the pressure would increase  $62\frac{1}{2}$  pounds  
per square foot— $62\frac{1}{2}$ , more nearly,—at a slope of two feet to  
one, that is two feet on the horizontal and one foot down vertically.  
The pressure would be  $62\frac{1}{2}$  pounds per square foot  
in every direction. The slope would form the hypothe-  
4362 nuse of a right angle triangle there. On the diagonal,  
the pressure would be  $62\frac{1}{2}$  pounds to the foot at a point  
one foot below the surface. One foot on the diagonal or one  
foot vertically, it would not make any difference in which  
direction it takes that plane there at that point, the pressure  
is equal in all directions, the hydrostatic pressure. The pressure  
at a point two feet down that slope, a square foot down  
there, extending from a point two feet down to a point three  
feet down on the diagonal, would have to be computed. It  
can be computed. The pressure will vary from point to point  
as you go down, but at a foot from the surface it would be  
 $62\frac{1}{2}$  pounds, and at two feet from the surface it would be  
twice that. At three feet it would be three times that, but it  
is varying and if you ask for the pressure on a foot that extends,  
say from two feet down to three feet, then it would  
4363 have to be computed as an average between those two.  
It would be just the same whether the direction were  
given diagonally or vertically so long as the edges were that  
distance from the surface. The pressure at that point would  
be the same as if you would measure that diagonally and take  
the pressure at that point, provided you get the same distance  
below the surface on a vertical line. A common  
4364 graphical representation of that pressure is a triangle  
with the apex at the surface of the water and the vertical  
side of the triangle represents the depth and the horizontal  
distances in that triangle represent the pressure at any given  
depth. Now, if we should take a certain area at a certain depth  
it would be represented, the total pressure on that, by the area  
of the triangle between two lines, horizontal lines, drawn from  
the vertical line at the given  
4365 depth. If this is a foot, the pressure on the upper edge  
is represented by this line (indicating), and on the lower edge  
by that line (indicating). Now, the ratio of those two sides at this  
latitude is approximately  $62\frac{1}{2}$  pounds. The

hydrostatic pressure at the depth of four and one-half feet would be approximately 280 pounds per square foot. For four and a half feet in depth with a slope of two horizontal to one vertical, the hypotenuse would be approximately ten feet. The total pressure upon that inclined slope per lineal foot of slope would be represented by one-half of the pressure at a foot multiplied by the area of one foot of slope or the product of ten multiplied by one-half multiplied by 280, equals 1,400 pounds. If the elevation of the water in the river were such that the top of the water in the river pool were on a level with or below the bottom of the water in the canal, the pressure of that pool of water in the river would relieve this bank by whatever pressure there was on the embankment due to the fact that the water percolates or seeps through the embankment, and partly saturates it. Experiments have shown that there is a saturation line in the embankment that has water against it on one side and the back of the bank is exposed to that hydrostatic pressure as well as the front. Now, in figuring the pressure on a bank of that kind, I would not take the depth on the front angle, but I would figure that depth to toe of the slope on the outside. There will be saturation and percolation of water running from the canal and seeping through all the way down to the toe on the opposite side. It may not go to the toe of the bank; sometimes it does go down and lays there, and the presence of a pool on the other side, although it don't come up as high as the bottom of the water in the canal, still would operate as a relief and support to the bank. There would be a saturation from the river side up to that level. The force of saturation would operate from the river pool in the same way proportionately to the amount of water within that it operated from the canal bank proportionate to the amount of water there, but it would be an element of danger if the water surface on the outside of it was higher than the water surface on the inside.

Q. Wouldn't it be so if the water reached the level of the bottom of the water in the canal?

A. I do not consider it so.

Q. You think that it certainly would when it reached the same level on both sides?

A. No, I would say then that the embankment was in a condition of absolute safety, by reason of the fact that the pressures were alike on the two sides. The pressure not necessarily operates by means of saturation.

It might be an impermeable bank, it might be a masonry bank, as far as that is concerned. It would depend on the saturation line, some kind of earth would have a different saturation from others, but with the water level on—at the same elevation on the two sides a bank of any material would be safe as far as pressure is concerned.

Q. It is not true, Colonel, that whatever danger there might be from saturation when it reached the danger point would be increased when you put saturation on both sides?

A. I do not consider it that way.

Q. The court asked you, Colonel, whether the pressure would be the same on the bank where it was substantially vertical, as in the picture, the upper picture, Woerman Exhibit of June 8th, that is on a slanting bank which is shown in the lower picture. What was your answer to that question?

A. That per square foot of area the pressure is the same at the same depth. If the court means, however, by his question, tending to move that bank horizontally, then I 4369 would say that the pressure is exactly the same at whatever angle that slope lies.

Q. Then the pressure being exactly the same, the pressure would be the same in the two banks, per square foot?

A. At the same depth in a horizontal direction.

Q. Then if the bank was made vertical, as it is in the upper picture, the number of square feet to which that pressure would be applied would be considerably less than where the bank is on a diagonal of two to one, would it?

A. Well, there are more square feet on the inclined slope but the pressure is reduced horizontally to exactly compensate for that slope.

Q. Then the statement that it has the same per square foot is a mistake?

A. No.

Q. You said a moment ago that the pressure would be the same per square foot.

A. At right angles to the surface.

Q. No matter at what angle to the bank. Now, you say that if the bank is made slanting the pressure per square foot will be reduced exactly enough to compensate for the increased number of square feet?

A. No, you confuse my answer.

Q. Put it straight.

A. I say that the pressure horizontally will be reduced in exactly the same proportion that the area is increased,

by that slope, so that the total horizontal pressure will remain the same whether the water presses against the inclined slope or a vertical one—

Q. But not the same per square foot because the number of square feet had been greatly increased, had they not?

A. There is a difference between the unit of pressure and the resultant pressure horizontally. Now, you are confusing the two.

4371 Q. No, I am not confusing anything, Colonel, I want to get your views, that is what I am after. I want you to tell us—

COUNSEL FOR DEFENDANT. His view is that you are confusing it.

COUNSEL FOR COMPLAINANT. Have your fun.

COUNSEL FOR DEFENDANT. I would like to have the Colonel elaborate on that view a little.

COUNSEL FOR COMPLAINANT. Go on, Colonel.

A. I have finished.

Q. Now, then, do you still say that the pressure would be the same per square foot no matter what the angle of the bank?

A. At right angle to the surface pressed upon, yes, the same per square foot.

Q. The water does not press at right angles to the surface on a slanting bank, does it?

A. Oh, yes.

Q. It does?

A. Yes, sir.

Q. It presses at right angles to the surface on a vertical bank also?

A. Yes, sir.

Q. And the vertical bank has fewer square feet than the slanting bank?

A. Yes, sir.

Q. Then the pressure on a vertical bank is less than the pressure on a slanting bank?

A. It is but the directions are not the same, and I qualified my answer by stating that the horizontal pressure tending to move the bank horizontally would be the same in every case.

4372 Q. Then it would be a different quantity per square foot in order to give the same results, would it not?

A. No.

Q. If you had a large number of square feet, you will have

to change the amount per foot in order to produce constant result, won't you?

A. No, I say the direction in the pressure—

COUNSEL FOR COMPLAINANT. May I ask one question there: Didn't you say, Mr. Wheeler, that in hydraulics the pressure is equal in all directions diagonally, laterally and every other way?

A. At a given point below the surface, in a liquid the pressures are in equilibrium, equal in all directions.

As to bad breaks on that feeder that comes down from Sterling into Hennepin Canal, I never heard of any. I have crossed the Desplaines river quite a good many years 4373 ago, but my first knowledge of it to any great extent was obtained in the fall of 1888. I was under order to make surveys and estimates for a 14-foot waterway, connecting the lake at or near Chicago with the Illinois river at La Salle, and I was placed in charge of that work. The first thing that I did was that I went into the field with a party that camped at Lockport, and commenced work on that survey. The work of survey extended for the remainder of that year, and practically all of the next year and included a small triangular, a system of levels, the topography and examination of the strata of rock below the surface of the ground. Well, I established a camp, tent and a cooking outfit and sheltered and fed the men at Lockport. I lived in 4374 camp with the men. As the work progressed the camp was moved along from place to place and when the field work was done I came into the city and had an office here. I think that during the month of November we broke up camp. I have no means of fixing that date now. I went to work in September and quit work in November. That is, quit living in camp.

We simply changed the manner of our work. The actual measurements with the survey of the stream were largely done at that time, and our men subsequent to that time boarded where they could.

4375 While I had an office and an office force engaged in reducing and platting the notes, yet I went from the office into the field back and forth to the parties who were doing work there but I did not live in camp any more after that fall. During the two months that I was in camp with the men, I was engaged, was working continually. I saw that the men went to work in due season in the morning, went with them, laid out a system of triangulation; was continually



in the field in looking after the work in the daytime. Frequently days I would be in the camp attending to correspondence and the finances of the survey, but I was busy all the time.

As to taking personally any of the measurements, I could not say whether I did. I did not many of them. I did not carry the chain. I might have handled the level.

I remember that I made the observations for determining the azimuth largely myself. That is the determination of the position of the true north and south line. That was when I began and at intervals throughout the work. None of that survey was done by the needle, it was all azimuth work. The particular function of this work that I did from time to time determining the azimuth. I determined the direction of the true meridian by observations upon the stars, and that was used in the survey, so that all their lines would be run to the true meridian. I did that by astronomical observations. I gave the delineation of those lines, or this true meridian to the subordinates after I had made the observation. That was always made in a way that it could be connected in with the survey. I did that not more than half a dozen times in the course of the work.

As to the principal use of instruments that I personally made in the field on this work, I don't recollect just how much I did do. I know that the little triangulation that was done, I looked after that, the setting of these stations. There was not very much of that in that survey, but I will say that generally the chief of the party does not do much of this actual measurement himself.

This map which is marked "Duplicate of Zarley's Exhibit," and which was sheet 13 in Major Marshall's report, also marked "Cooley 25" (Atlas, p. 3969; Appendix, p. ....), it is so long since I have seen that map that I hardly recognize it as one of my own production. It says so in the title that it is. I could not say whether that is actually a whole one of the waterway maps, or whether it is a reprint of part of it. I could not find on that map any specific point that I indubitably remember as mine, by which I identify my work on that map. It might be an imitation. I do not vouch for its authenticity at all.

So far as the work that was done by me in connection with that map is concerned, or the work that purports to be represented by it, there is no measurement that I personally took that is recorded there in a way that I identify as mine, and

that would probably be true of all the other maps, that azimuth line indicating my true meridian. I don't see it here. Nothing by which I can identify it.

My recollections of the Desplaines river itself, are recollections of work that was finished some eighteen or nineteen years ago; recollections as it was at the time I was doing that work. I had had no occasion to refresh my memory 4379 about that. I have not made any effort to do so.

Q. You speak in the report signed by you, which was published in House Document 264, of the House of Representatives, 51st Congress, first session of the Ogden Dam, and you made the statement: "At low water the entire flow passes in part through the Ogden Dam, but the greater portion into the canal through the permeable soil separating them." Do you remember the Ogden Dam, Colonel Wheeler?

A. I remember something of it; yes, sir.

Q. Referring to Hillebrand exhibit labeled "Sanitary District Chicago Map and Profile," you referred to this Ogden Dam, which separated the Desplaines river from the Ogden ditch, which connected it with the south branch of the Chicago river, by that statement?

A. Yes, sir.

Q. And in this statement, that: "At low water the entire flow passes in part through the Ogden Dam," you mean that it passes in part out of the Desplaines river through the Ogden Dam into the Ogden ditch and so out into the south branch of the Chicago river?

A. I suppose I did if I made that statement.

Q. Well, just glance at the statement, the last sentence on the bottom of page 40 of the document. (Showing witness book.) You will find your signature to the report over here a page or two further on. That is correct, is it not? 4380 Now, you have examined the statement, is that correct?

A. I suppose it to be, yes, sir.

Q. Now, the other, the remainder of the sentence is: "But the greater portion into the canal through the permeable soil separating them." By which you mean that the water of the—the greater portion of the water of the Desplaines river at times of low water soaked through the permeable soil into the Illinois and Michigan Canal, which was close by it?

Thereupon counsel for defendant objected to the question, and then after some colloquy of counsel on the ground that the witness did not have the book in his hands, the witness answered:

4383 "I think I understand this question; and I believe that the statement there in regard to the low water flow of the Desplaines river is correct as applied to that time." Counsel for complainant then asked:

"Now, in order that you may be clear, I will read again the statement that: 'At low water the entire flow passes in part through the Ogden Dam, but the greater portion into the canal through the permeable soil separating them.' Is it correct, Colonel, that you mean to say that these two causes operating together, the flow of water into the dam into the Ogden ditch and so into the Chicago river for one, and the soaking through the permeable soil into the Illinois and Michigan Canal as the other, those two causes could absorb and take up the entire flow of the Desplaines river in times of low water?" To which the witness replied, "Yes, sir."

And that is between those two cases, the cause of seepage and soaking of water of the Desplaines river into the canal was the greater of the two. It appears I so considered it at that time. There was more water that got away from the Desplaines river by soaking into the canal than there did by running through the Ogden ditch into the Chicago river, appears from that statement.

I had no experience in canal construction or operation prior to the Hennepin Canal. I had observed quite a good many canals before my work along that. The portion of the Hennepin Canal built at Milan went into operation in the spring of 1895, and has been continuously in operation ever since. That is four and a half miles of canal proper and eight miles of river. I treated the Rock river itself as a part of the canal for those eight miles. The old plan called for the entering the Rock river at Meredosia, but the plans as actually constructed, the canal centers the Rock river at the mouth of Green river. At any rate, this eight miles would be the point where these banks are, and the Rock river is the canal, and the canal is the Rock river for those eight miles. I think there are three rock reefs in that distance, the remaining distance it is a sand bottom.

4386 I have never made any test borings or explorations, but others have, and they report that it is material that can be dredged down to the required depth, except in those rock reefs. The practice with reference to paving towpaths on the Erie Canal I ought to know. I carried a level the whole length of it. It was not paved on the towpath. I don't re-

member any point at that time that was paved on the top of the towpath, but it was paved on the slope next to the 4387 water, in 1875. There were a good many steamboats on the canal at that time. The greater proportion of the navigation was by means of barges hauled by horses and mules. A great change may have taken place in the '70s in the use of the Erie Canal in that particular, but it had not taken place at the time I was there, because the major portion of the transportation was done in those barges hauled by horses and mules.

4388 I did not make any approximate estimate of cost of the amount of work necessary to protect this towpath bank of the canal against the operation of this pool, never made any figures on that at all. Well, I know only in a general way what it costs to do that kind of work, but I have made no measurements of quantity there, or no estimate of cost. I gave some figures on the cost of restoring the aqueduct, called that \$75,000, and gave some figures on the putting in of a siphon pipe to feed the canal, and also the erection of a couple of locks. Those I figured to amount to \$58,504.

The maintenance of two such locks and the maintenance 4389 of the siphon would entail costs for maintenance. I would say that in all probability the cost of maintaining the aqueduct there with one lock would exceed the cost of maintaining two locks and a siphon pipe in the end. I would not consider it very safe construction to maintain the aqueduct without any lock. The cost of maintaining a double system of locks together with a siphon pipe feeder might and might not exceed the cost of the open aqueduct without a lock. That aqueduct is in a position where it is exposed to great danger and it is so that a single accident to the aqueduct would exceed the maintenance of two locks for a long period of 4390 time. I made no allowance in my figures of any capitalization of the cost of maintenance. I did not make any allowance for the cost of operation. As to the cost of operation from this double set of locks on each side of a mill dam built of this kind, being very much greater than the cost of operation of an open aqueduct, I did not estimate on a double set of locks on each side of that river. Your question is erroneous in that; a single lock on each side of the river. The cost of maintenance of an aqueduct there is a very uncertain quantity. I have never maintained an aqueduct on piers in that way. I have had to do with that sort of work. Unfortunately, I have nine of them to look after now, much to my

regret. I would rather have them siphon pipes, but it  
4391 could not have been done in the situation where these  
were located. I figured here on a pipe 752 feet long. They  
extended from the upper end of one lock past the lock and  
past the entrance for a boat to enter within the shore before  
locking, and the width of the river, past the lock on the other  
side. If you had a siphon pipe for supplying feed water, and  
if you had a lock system for getting boats across, and you  
were trying to use them both at once, you would not need two  
sets of water. The water is feeding down and it would be  
necessary to supply whatever water was used in the actual  
lockage, but otherwise the water would feed through the  
siphon pipe and go into that level of the canal. I understand  
that this Kankakee feeder brings water from the Kankakee  
river across the country and cross the top of the river at an  
elevation of some 76 across the river on piers into the  
canal.

4392 I am proposing to attach my siphon pipe to this Kan-  
kakee feeder some six or seven hundred feet to the left  
of the place where it crosses the river and take the water out  
of the feeder and carry it down into the river and then up to  
the canal by means of that pipe. I did not say 700 feet from  
the river, but the total length of the pipe is that. At any  
time you wanted to use the lock for locking a boat down in  
the river by means of this water, you would not have to stop  
using the siphon while you did it. There would be a lock full  
of water locked into the river. I would not say that  
4393 even it would be double the amount of the lock full. The  
flow through the pipe would be continuous, whatever  
was demanded to supply that level of the canal or any demand  
upon it. Whenever a boat passed across they would abstract  
a lock full of water on each side of the river from that supply.  
The current would be running through the siphon all the  
time. As to there being this lock full alongside of it in addi-  
tion to what you took out of the main current, there would be  
that much water that you would use from the supply brought  
down by the feeder.

As to making a computation on the supply of water which  
the Kankakee Dam would afford, in this way I did. I as-  
sumed that the supply would perhaps be from 80 to 100 cubic  
feet per second in that feeder. I assumed that the Kankakee  
river can supply much more than that if necessary. The  
4394 data upon which I made that assumption—one thing was  
the reported computation of the measurements made

from the early survey of the actual flow in that river. I did not hunt it up myself, but it was reported to me by the person who did it, Mr. J. W. Woerman; he told me of a measurement which he found, an actual measurement. That amounted to something over 80 feet per second. My statement as to the adequacy of this system is not based on that.

As to knowing what current of water was required in the Kankakee feeder as it originally existed to make a discharge of 100 feet per second, I have not computed it at all. I saw the feeder and know its dimensions approximately. I did not think there would be any difficulty in bringing down as much water as that through that feeder and raise the water 4395 high enough at the head to bring it through. I haven't made any investigation as to what the conditions of the water supply were with reference to this feeder at all. I did observe what the level of the floor of the aqueduct was. What it was in actual feet, well, I could not to my knowledge say, because there wasn't any measurement made when I was there, but I know approximately where it is. Its relation to the crest of this dam is only a short distance, I believe, above the crest of the dam, probably the pool, also. The bottom of the aqueduct is above the top of the dam a slight amount.

Q. Well, what you know about that is something that you learned in the course of your conversation with these gentlemen who were with you?

A. And information that they furnished me. I believe I have that data in my pocket, if you will allow me to refresh my memory.

Q. They gave you some figures on it, did they?

A. Yes, from the actual levels.

Q. Well, if you have got in your pocket the figures of the actual level of the bottom of the aqueducts as compared with the crest of the dam and you want to refresh your memory about it, I would be glad to have you, I will be very glad to have you give it to us.

A. The figures that I have show that the recess in the pier is below the level of that dam, but that the bottom grade of the feeder is at the elevation of the crest of the dam.

Those figures were given to me by Mr. Woerman. The elevation of the pool level is given as grade 77. The elevation in the recess of the piers of the aqueduct on which the aqueduct trusses rested is 73.6. The bottom grade of the feeder is given as 77.0. I have after that the note Sanitary District. It is possible that they may refer to the level of the Sanitary



District instead of to the same datum that these others referred to.

I personally visited the Bridgeport pumps from time to time from 1881 to 1890. I have not done so since that time.

Q. Do you remember, Colonel, that during the period 4397 that this survey was going on there were from time to time times when the pumps were stopped in their operation?

A. I do not remember that they were.

Q. Let me refresh your recollection. Don't you remember it was one of the things that you looked into that you had them at one time—that arrangements were made that the pumps were stopped for about a week so that you could make observation when the pumps were not in operation?

A. I don't recollect such a thing.

Q. Isn't that the fact?

A. I do not recollect it, I say.

Q. And then again you had observation of their maximum capacity?

A. I have no recollection of any such circumstance.

Q. And then again observations of their ordinary state of operation?

A. No, sir, I have no recollection of that either.

Q. Don't you remember that there was considerable complaint made from the people down the valley about the stopping of the pumps?

A. No, sir.

Q. And the reduction of the volume of water that was coming down?

A. No, sir; I don't recollect any such thing as that.

The size of the boats that I use in the Hennepin canal is less than 35 feet in width, less than 155 feet in length, 4398 and drawing not to exceed seven feet. How much of a fleet of boats I maintain on the canal, I do not know. Under the control of the canal officers at present there is one steamboat, a stern wheel towboat and one towing launch, gasoline, one boat termed an office boat. And I am building 12 barges for freight of which nine are now complete and one launch—one flat boat has been converted into a quarter boat for the men. We have borrowed, I think, five office boats from another district. Those are boats directly under my control on the canal aside from small boats. The towboat to which I have referred is a launch about 40 feet in length; the beam I do not know, probably not far from seven feet. And it has



a two-cylinder gasoline engine sixteen horse power connected with a wheel, a towing wheel about three feet in diameter; its ordinary draft when in operation I suppose is about three feet. It will tow these towing barges to which I have 4399 referred. I am using it all the time for that purpose.

Well, we use those exclusively for the purposes of the canal. We are delivering lumber and hardware for houses and stone for riprapping, and things of that kind, but we do not carry freight for commercial purposes. There are freight boats on the canal owned by private parties. The canal then, admits of freight boats by anybody that wants to come on it; entirely free to all persons, of course complying with my regulations. There are a number of freight boats owned by private parties that are now operating upon the canal.

4400 I have no military title.

A transportation company has been organized and they are getting together a fleet of steamboats and barges. They have constructed one barge 24 feet in width, 120 feet long, and 9 feet depth of hold, for the purpose of carrying grain. I think they estimated the capacity at 20,000 4401 bushels. Of course it cannot be loaded to the full depth of the hold carrying grain. But a vessel may be deeper in its depth of hold than the depth of water it operates in—always is. So that the fact that a boat was recorded as nine feet depth would not mean that it needed nine feet of water to run in.

They have purchased and fitted up one steam barge, the City of Henry, which is a barge about 100 feet long and 18 feet wide, adapted to carrying grain or coal in its hold. They have purchased a small stern wheel steamboat, the Beder, from the Mississippi river, and equipped her for towing. They 4402 have built or rebuilt one pleasure barge for excursion purposes, which I suppose is about 100 feet by 20 with a carrying capacity, as they state, of 200 persons. They have another barge on the way of somewhat smaller dimensions, and I do not know the purpose for which that is to be used. There is another steamboat there that has come in for carrying excursions which is about 50 feet long, by perhaps 16 feet wide, more of a lake model, not a flat bottom boat. All along the canal they are getting in a large number of gasoline pleasure boats, launches.

Q. Have you given the figures on the smallest size of freighter or would the launch that you describe as the prop-

erty of the United States perhaps be about the smallest of the freighters?

A. That launch I am using to tow barges which I am building, through the feeder on the main line. A small boat can handle them.

Q. Would that be perhaps a type of the smallest form of freighter or perhaps you have some still smaller in mind?

A. No, I would hardly call that boat a freighter. She does do towing, but she was built for pleasure purposes originally.

Q. But you are in fact using her for freight purposes?

A. Yes, sir, towing purposes.

Q. What I asked you was whether you had in mind a freighter of still smaller dimensions?

4403 COUNSEL FOR DEFENDANT. One moment now, he does not say it is a freighter. He said for towing purposes. Towing is not freighting.

COUNSEL FOR COMPLAINANT. The captain and I will get along all right.

COUNSEL FOR DEFENDANT. Yes, I haven't any doubt of it.

COUNSEL FOR COMPLAINANT. I will get along with the captain.

The COURT. That hardly disposes of the objection, though.

COUNSEL FOR COMPLAINANT. The objection is to a comment by counsel, a criticism on language that has passed.

COUNSEL FOR DEFENDANT. Yes, really only the second objection I have made this morning, and I will withdraw that.

The WITNESS. I would not call that launch a freighter. We do not load freight into her to any extent, but she does do towing; also does miscellaneous errands and traveling on the canal. She is not a type that would be built for freight purposes on the canal or upon any other waters.

Q. Now, you may tell us whether you have in mind any smaller freighter than the dimensions of this towing launch to which you have referred?

COUNSEL FOR DEFENDANT. I object to the question.

The COURT. He may answer that.

A. I haven't any boat in mind.

4404 I would not say that this was the first fleet I have had charge of. I have had other fleets. Oh, I would hardly call it a fleet. I had a steamboat and a dredge and some dumping scows doing dredging at one time, and traveled a little on the Mississippi river with the boats under my control. I mean to say that at one time I had charge of a dredging fleet in connection with this same canal, the Hennepin Canal at

its western entrance. That is what I would call a construction fleet. I also had some work in connection in the earlier years down on the Mississippi river. I have described it 4405 as having charge of large surveys. I say I had charge of large surveys in the field, and had occasion to use steamboats and other boats, lived on quarter boats during this operation, during the progress of the surveys, and had some difficulties in navigation which I remember quite distinctly, at several places on the Mississippi, one place a short distance above Natchez, for instance. I went ashore amongst snags and floundered about the drift there for twelve hours and looked to be in a pretty bad case. I had two boats and a steam launch, and they went ashore together. The launch extricated itself, but the boats were fast, and in the night I succeeded in getting assistance from Natchez to pull the 4406 boats out. That was in the spring of 1883. Well, it is like other boats that go ashore. They usually do not go from desire of those navigating them, but because they cannot help themselves. It was one of the inherent difficulties of the situation there. One of the difficulties was that I had not sufficient motive power to control the boat which I had there in the high wind which set up after I got loose from the shore above. The wind would drive us on the bank. Well, I ran ashore on sand bars several times against snags, and to the shore several times when I did not want to go there; nothing else. That is, the encountering of sand bars and snags and obstacles lying in the river, or being driven upon obstacles on the bank, and by storms on the water also. Those were the principal difficulties.

4414 ADAM COMSTOCK, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Adam Comstock. I am the same Adam Comstock who has already given a deposition in this case.

Q. Mr. Comstock, in this case certain witnesses have testified that there was a road in 1858 or 1855 which 4415 branches off from the Brandon's road and ran to the water edge, and that this road was deeply rutted. Do you know about that road?

A. Yes, sir; there is a little island marked on the plat there.

COUNSEL FOR DEFENDANT. The witness refers to Woerman's Exhibit 4.

A. It is opposite a point that is marked 118 feet wide there, there is a little island there, where counsel for complainant has just placed a cross.

Well, the earliest days there was a ford just below that little island and a road. There was a public road for many years until the bridge was built; when the bridge was built that point was abandoned. There was not ever any landing place at that point.

COUNSEL FOR DEFENDANT. Where was your farm with reference to the position of that road?

A. That what?

Q. Where was your farm with reference to the position of that road?

A. I don't just get that.

Q. Where was your farm on which you lived—

4416 A. Oh, the farm? We lived five miles down the river from Joliet.

This road is about a mile and a half south from Joliet, it run from the Brandon bridge down to the ford just below the island. We lived on the farm there from 1837 to 1841, and then in Joliet after that. My father owned land along the river other than that on which we lived. In 1845 he bought a piece of about forty acres of land where the Adler slaughter house is. It is right within a quarter of a mile of this road. He owned that land up to 1860, some time in the '60s. When we moved to Joliet we got our fire wood off from the farm, so that we were going backwards and forwards frequently, and we got our hay off from the farm up to 1845. Then  
4417 we bought this 40 acres at the head of the lake and we got our hay off from that after that. In going backward and forward between the farm and Joliet we passed this road. The road branched off at Brandon's bridge. The road to the farm run for about three miles and a half right in sight of the river.

4426 My business is that of a surveyor, and I have followed that business right along since about 1849 and am still following that profession. I will be eighty years old next September. There was never anything done as to the building of the Town of Buffalo on the northwest quarter of Section

2, in Township 34, North, of Range 9 East, in Will County. I know the place.

4427 Referring to Exhibit A-7, the plat of Vienna, recorded September 19, 1835, there never was any town built known as Vienna; there never was any house there at all.

4428

*Cross-Examination.*

I know W. W. Stevens of Joliet. I remember having a conversation with him at his office last fall or winter.

Q. Do you remember his remarking to you, "Adams, I don't understand how they ever got those large boats up over the rapids at Treat's Island"?

A. Yes, I know we used to talk about that.

Q. Did you reply to him on that occasion, "They warped them up?"

A. No, I said that they, that, that the matter was simply adopted to get up rapids or down them as they call it, run out a long rope and hitch it to a tree and then stand on the boat and pull on the rope. That is called cordelling.

4470 JOHN M. SNYDER, a witness for defendant, testified as follows:

*Direct Examination.*

My name is John M. Snyder. I am acting secretary and chief clerk of the Illinois and Michigan Canal. I have  
4471 already given a deposition in this case. I have charge of the books, records, and other documents belonging to the Illinois and Michigan Canal. There is among those books one showing the lands of the canal, upon which the lands were deeded and sold. This document that is now handed me is a photograph of one of the pages of what we call the land sale book, although it may not be designated on the back of the book.

COUNSEL FOR COMPLAINANT. Photograph of what?

COUNSEL FOR DEFENDANT. Photograph of one of the pages of what they call the land sales book. That is the book according to which the lands were sold?

A. The lands were sold originally; yes, sir.

Q. Do you know whether that is a correct photograph?

A. Yes, sir.

Q. Were you there when that was made?

A. Yes, sir.

Counsel for defendant offered the sheet in evidence.

Counsel for complainant objected to it on the ground the photograph is not competent evidence and that it is  
4472 not shown to be relevant or competent or material in any point of view, if the original were here.

Thereupon counsel for defendant offered to have the same plat certified to and contended it was admissible on the subject of meander line.

4476 The COURT. The map may go in solely in reference to the meander line.

COUNSEL FOR COMPLAINANT. We object to it from that standpoint, as well as the other.

The COURT. Overruled.

Everything that appears on the map, on the photograph, appears upon the book from which it was taken, all those figures and all that appears on the original map, and all the records. That writing has been there ever since I have been connected with it. I have been connected with the office between four and five years.

Thereupon objection was made by counsel for complainant that it was not admissible for any purpose.

Whereupon said map was introduced in evidence and marked Snyder Exhibit A. (Atlas, p. 3979; Appendix, p. ....)

4639 PATRICK FOGARTY, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Patrick Fogarty. I live in Joliet. I first  
4640 came there in 1872, then I went away from there. I was around there for three years and then I went to California. I was in California for about five years, and then came back there in 1880. I have resided there continuously since. Well, I worked the first three years I was there, I was working at the stone cutting trade, in the City of Joliet in different quarters around there. Well, I came back there in 1880; I worked for five years for the Joliet Stone Company there as the stone cutter, and foreman over stone cutters and foreman in the quarries. Then I started in business for

myself, two miles and a half below Joliet, well, some time in 1885 or 1886, I would not say which. I started in at that time in the quarry business. I owned a quarry. I was in partnership with another man down there near what is called Patterson Island, two miles and a half below Joliet. I 4641 stayed there, in with him about two years, then I sold out and opened another quarry down at Rock Run, about six miles below Joliet—between five and six miles. That quarry is on what is known as Lake Joliet, right at the mouth of Rock Run Creek, at the northeast bank of the creek. The quarry was on the right hand bank going down stream. I opened that quarry up in 1888. I operated it about eleven years, from 1888 until 1889, or 1898. I built a bridge across the river there, a narrow gauge railroad and took the stone over to the Santa Fe. The Santa Fe run right opposite the quarry on the other side of the river, not on the other bank exactly, but there is between eight hundred and a thousand 4642 feet between the Santa Fe and the bank of the river there at that place. The kind of a place that I built across the river might be called a trestle bridge. I took the posts, timber there, took two posts and set them up like this, put cross-pieces on the bottoms and then took and put the cross-pieces like that, you know, so that they could not sway (indicating), and put out posts down into the water there and drove them down with a big sledge till we got to solid bottom and cut the posts off then so they would be even. This is the point on Woerman's Exhibit 4, where the railroad bridge is marked, the point where the bridge was built across Lake Joliet (counsel indicating on map). It run pretty near in that way, close by that. It was right by this line but not on the angle that is shown there, more on an angle like that (indicating). It was at the very narrowest point of the lake near about Rock Point, right on the section line. It 4643 struck the bridge about fifty or seventy-five feet from the shore. The first bridge I built was between four and five feet, between the water and the bottom of the stringer; I had 14-inch stringers in. That bridge remained there four years. Well, I built the bridge in 1888; it was washed out in 1890, and the bridge all stayed there with just the fish plates broke off and the rails that I had on the south side of the bridge. The bridge left out and swung around and all stayed there; I went and put it back just as it was. Then it was washed out again in 1892. Then we took and rebuilt it and raised it up higher and put longer stringers in.



I raised it up then so the top of the bridge was about seven or eight feet above the water. That bridge stayed there from 1892 until 1899. I took it out in 1899, so that those bridges that I maintained there lasted there from about 1888 until 1900, about that, a period of about twelve years. And they stretched clear across the river. These trestle posts  
4644 were apart. The first bridge I had in, I had 16-foot stringers. The second bridge I put in, I had 32-foot stringers, except one span in the middle of the river, that was 50 feet. I did not get any authority from anyone to build that bridge across there.

Q. Does this paper that I show you contain a correct representation of the bridge as it existed from your quarry across Lake Joliet?

4645 Objection as immaterial and irrelevant.

The COURT. You may ask him what it is.

COUNSEL FOR DEFENDANT. Now, Mr. Fogarty, state what is represented by those pictures upon that paper just handed to you.

A. Well, the lower picture represents the bridge here about as near, I should judge, as it was; and the upper center picture here is a view of the quarry and the other one  
4646 up here is of an old building in Joliet that was built from the quarry.

That picture was made I think somewhere in the fall of 1888, as near as I can recollect. You see the date on here, that is the price list that was printed in 1899, in April, 1899, but to the best of my recollection there was a man down there sketched this in the fall of 1888, as near as I can recollect. It is substantially a correct representation of the quarry and bridge across the river there. It was not sketched by an artist and engraved.

Counsel for defendant then offered in evidence the picture of the bridge.

Objection overruled.

4647 Said document was received in evidence and marked Fogarty Exhibit 1. (App. II, p. 3904; Appendix, p. ....)

Q. State whether or not there was any navigation took place up and down through that bridge during the twelve years that it remained there?

A. Nothing more than rowboats, fishermen and hunters that went up and down there.

As to how familiar I am with the Desplaines river below

Joliet, well, I know the river middling well from Joliet down to Millsdale. Millsdale is the point where the bridge was built across to Treat's Island, from the south bank of the stream. I did have occasion to consider the matter of floating the stone down that part of the river. Well, when they started in to build the Millsdale, I wanted to put in a bid on the abutment of it, stone work, and I went down there, investigated it around the head of Treat's Island to see whether I could  
4648 float stone from the quarry at Rock Run down there or not. Well, I was thinking about building a scow or flat boat.

COUNSEL FOR COMPLAINANT. I move to exclude what he was thinking about.

The COURT. Yes.

COUNSEL FOR DEFENDANT. That is preliminary, to show the purpose of his investigation.

COUNSEL FOR COMPLAINANT. It is objected to.

A. How shall I answer it? I went down there and investigated to see how deep the water was, to see whether it would be practicable to take a boat of stone down there or not and I found the water was very shallow for a great ways and then I didn't think I could get the stone down there on the flat boat.

COUNSEL FOR COMPLAINANT. I move to exclude it.

The COURT. You abandoned the scheme, did you?

A. Yes, sir; I abandoned the scheme.

I was not considering any particular size boat there at all. I only thought if I could get one that would draw a foot or eighteen inches of water when it was loaded.

Q. What was the result of your investigation and soundings down there as to how far you could get down with such a boat?

4649 Objection overruled.

COUNSEL FOR DEFENDANT. Q. State what you found in your investigation there, Mr. Fogarty?

A. Well, I found I could not get within from three to five hundred feet of the head of the island with a boat drawing a foot to eighteen inches of water, the way the water was then.

As to why I said I could not go down any farther than that, that was because there was not water enough to get down within from three to five hundred feet of the island; that  
4650 was the only reason; that there was not water enough.

The bed of the stream there above the head of Treat's Island was full of—awful stony. There is all sizes there from

the size of your two fists up to weighing a ton apiece or more, some of them. I was there when the bridge was washed out in 1890. I had a car drift down there that was loaded on the bridge and it struck against the head of the little island. I went down with a team to get the car out and I had a time to get it out of there on account of the rock, stony bottom, and I knew from that that you could not drive in around there and haul a load. Above Treat's Island, at the time I made this investigation, I think there was from one to two feet of water. I observed the condition of the stream below the 4651 head of Treat's Island. The channel was narrow and run with a riffle down on both sides, all of those islands. There was a ford there where we used to drive across with a horse and buggy, drove right across from the south side over the big island and then on to the west bank. The condition of the bed was pretty stony. Where the ford was, somebody, I guess, must have thrown the big boulders out. There was lots of big boulders down there below the ford in both places.

COUNSEL FOR COMPLAINANT. I move to exclude what he says, somebody must have done.

The COURT. What must have been done, may go out.

There is a few in there of big ones and there is other smaller ones. I never took particular notice only here and there where I could see the water would come up and strike them and make a deep fall. There were some that would weigh up to three or four tons. There were some, of course I 4652 didn't call my particular attention to it because I was not concerned in it, because I couldn't say exactly how plentiful they were, but I know there were boulders scattered all over here and there. There was some sticking out of the water and more we could see the water breaking over them.

Q. How far up stream did you have occasion to go on the river above your quarry?

A. Above the quarry?

Q. Yes, sir.

A. Well, there on Lake Joliet above the quarry?

Q. Yes.

A. You are going from Treat's Island way up two miles and a half above.

Q. Now, I am going the other way.

A. All right. Then I want to understand.

Q. Do you know the river above where your quarry was?

A. Yes.

Q. About how far above?

A. Well, from where the quarry was there up to Patterson's Island there is all the way—well, from four to ten feet of water. Then when you get up to Patterson's Island then the water begins to get shallow from there up to near Brandon's Bridge. You can run on your rowboat up to about

Brandon's bridge, and when you get to Brandon's bridge 4653 water shallows there, it used to be, so that you could

wade across there with a pair of boots and would not get your feet wet. That was down from Brandon's bridge to Joliet; and from Brandon's bridge up to where the mouth of Hickory Creek comes in. At the time the Brandon's bridge was built I was in this other quarry down at Patterson's Island and we furnished a lot of stone that went into Brandon's bridge, and we run it up on the railroad, we dumped it off there and then took trucks and hauled it into the river there on a stone truck. Right at Patterson's Island it is four or five feet. It shallows for a quarter or half a mile till it gets up to near Brandon's bridge, and then it shallows right at the bridge and just below the bridge, and up this way, from there all the way up till you get to about pretty near the city line of Joliet. In the stretch of the river from near Brandon's bridge up to near the city line of Joliet, you could

4654 walk across with a pair of boots on. You could walk

across with a pair of boots on there lots of times for two or three months in the summer time. That was before the drainage water was let in. The character of the bed of the stream for that stretch is all boulders and rocks. I never went right down to get right down into the river there, only they seemed to be scattered all around in there, from what I could see from the bank of the canal. I was never down in the bed of the river there, only I could see the boulders were pretty plentiful. They were exposed. The water did not run over them, the water run around through them. I did not ever try to go up through that stretch of the river with a rowboat or down it there. I have been down the river from below Brandon's bridge, down around the head of Treat's Island in a boat.

I have had experience in navigation somewhat. I was 4655 brought up in New York State on a lake there; Otsego

Lake; learned how to run a rowboat and sailboat. I was on the Mississippi, St. Louis to Keokuk, Iowa. On the Sacramento river from Sacramento to San Francisco, ten or a dozen times.

4656 COUNSEL FOR DEFENDANT. Q. I will ask you Mr. Fogarty, whether in your opinion the Desplaines river between Joliet and Treat's Island is capable of being used for ordinary purposes of commerce?

COUNSEL FOR COMPLAINANT. Objected to the question on the ground that there was no foundation laid for an expert opinion.

Overruled.

A. Well, I would have to qualify that, from Patterson's Island down to near Treat's Island you could navigate it with a boat drawing from two to three feet of water. At Treat's Island, when you get down through there you could not navigate it with anything but a rowboat; and from Brandon's bridge up into Joliet it would be a hard matter to navigate it with a rowboat when the water is at ordinary stage.

4657 I have drove up and down the stream below Treat's Island in a horse and buggy, from there up to the mouth, but I do not consider myself familiar with it. I did not observe the river down near its mouth. I have drove along the road there maybe four or five times with a horse and buggy, and all I could see was what I could see from the road. Right down along the large feeder there. I did not ever know of any commercial navigation being carried on on the Desplaines river.

4658

*Cross-Examination.*

I had a bridge across the river. My bridge was built the first one in 1888. It was washed out in 1890, two years afterwards, and that bridge had been built about five feet, four to five feet above the water line. I did not build a new bridge when that had washed out. The fish plates broke off at the south end of the bridge and the bridge all stayed there, and I just put it right back in again as it was, got the same bridge back. It stood then until 1892. Then it was washed out again. I see I was too low down then, and I took and rebuilt the bridge then.

Thereupon counsel for defendant secured permission to ask further questions on the direct examination.

The witness testified as follows:

4659 I was familiar with the river up and around Lemont and Romeo, and Lockport. I have known it for years. I have been going up and down there ever since about 1885. I have been fishing up there since they let the water in from

the drainage canal, and went across the river there on the riffles without getting my feet wet. I had on ordinary leather boots. Before they let the water out of the drainage canal, the condition of the river up there during the summer seasons was very low. This was above Lockport. The drainage water was not going in where I went across. It was lasting from three to four months, from the summer time, sometimes six months. During those months, it would not be more than six or eight inches. Sometimes it would not be that.

4660 That was after the water from the drainage canal was put in; that was after the water, drainage water came in above that. It was somewheres above Fitzpatrick's line in Lockport.

Q. You were fishing up there?

A. Yes, sir.

Q. Fishing in six inches of water?

Q. Fishing in six inches of water?

A. Well, I was fishing along the river there wherever I could find a deep hole.

A. What?

Q. I understood you to say you waded all around there with your boots on?

A. No, sir. There was some places it was deeper. I am speaking of the ripples. I am speaking of the shallow places.

Q. Did you have big rubber-hipped boots on?

A. No, sir; just ordinary leather boots.

Q. Waded across?

A. Yes, sir.

Q. Fishing all the way across were you?

A. No, sir; I was not doing any fishing there. I was going across the river, going from one side to the other. I was fishing in the deep places, deep spots.

Q. And you looked and found where the ford was, the place, and followed it on the ripples across over?

A. Yes.

4661 My first bridge was in 1888, washed out in 1890. I re-built it in 1892. Brought the bridge up higher. I placed it about eight feet above that, about that. On the first bridge the spans were fifteen feet, and the next bridge they were thirty-two feet, except one span; I had one span in the middle of the river, was fifty feet, where the water was deepest. About a carload of stone that was washed down somewhere, it was not a carload of stone; it was a dump car that I had for taking away the rubbish from the quarry and when the

water got high in the river I loaded the car and ran it onto the bridge to try to hold the bridge down, and when the bridge went out, the car went over into the water and unloaded itself and went down against a little island, and I found the 4662 car down there and the little scale boat for loading stone on. I run all of the cars on the bridge loaded, to try to hold it down. The kind of boats I had stone on was scale boats we called them. We just took it, two inch plank and spliced them together like that, spliced them together cross-ways. They make them different sizes in different quarries. The one I had was 5 feet by 6, or 5 feet by 7, four inch thick plank. When the bridge got away, the car that was on the bridge was upset and emptied itself of stone and then floated down the river. It floated about two miles and a half, and then I went down there and got hold of it with horses and pulled it out. I made the investigation down there below Treat's Island, or above Treat's Island. As near as I can recollect, I cannot say positively, I think it was 1895, but I won't say for certain. It may have been 1894, or 1896. I think it was in September or October. I cannot say which it was, the fall of the year.

Q. Where was that ford where you say they crossed 4663 the river? I think you say about Treat's Island where the stones were not in the way.

A. Where I suspected that they had taken up and moved the stones was where the ford was, the ford led right across from the south branch; it was not exactly the south there, but they call it the south. The ford is about 600 to 800 feet below the point of the Big Island, at Treat's Island I mean. It was not 600 to 800 feet below the lower portion of that island, the upper point, below the upper point of the island, as near as I could judge. I didn't see them picking up any stone there and moving them. I don't know as there had anybody, but the ford had been used for years. I was nearly—

Q. But there was a place there where there were no 4664 stones to interfere with travel in the river?

A. No; there was no very big ones; but they were not smooth.

Q. Not so big, but what you would drive a wagon right over them?

A. No, sir.

Q. Or ride a horse over them?

A. No, sir.

I was raised in New York, near Otsego Lake. While there



I learned to row a rowboat and run a sailboat, and I left there in 1871. That would be thirty-seven years ago. I was fifty-nine last May; this May. I was twenty-one or 4665 twenty-two years old when I left there. I was on the Mississippi river once. I said I had rode on the Mississippi river from St. Louis to Keokuk just once on the boat, made one trip across it, that is all, came up on the river from St. Louis to Keokuk as a passenger. I spoke of being on the Sacramento river. I was on the boat there simply as a passenger, that is all, and went from Sacramento to San Francisco. I was up and down there I guess ten or twelve times, every time as a passenger, and that was all the waters that I have been on.

Q. You do not profess to be very much of a sea-dog, do you on that experience?

A. No, sir.

*Re-direct Examination.*

4666 Take those pictures there and you will see a scale boat hanging right on the derrick there. They were used for putting rowboats down on. They were used on the land. They were merely plank just laid across each other like that and spliced together, and some quarries had them 4 by 6. I had them 4 by 6, and 4 by 7. There was some iron run across about 18 inches from one end, and another iron in the other end with a loop down 2 or 3 inches, and we ruled on those to take them over to the car, take them over to the railroad, hoist them up and dump them into the car. It shows one there hanging on the derrick in the illustration.

Q. What was this quarry at Rock Run that you run and operated for some time known as? What was the other name for it?

Objection as not redirect examination. Overruled.

COUNSEL FOR DEFENDANT. Q. What did the people call it?

A. Well, there locally the place is known there as Rock Run. That has been the name, that has been the local name.

4667 Q. Did the quarry have a name?

A. Yes, sir.

Before that time, it didn't have any other name. It was on William Miller's land. I think, as nearly as I can recollect, it was known as the old Swallum quarry. There was a quarry opened there, near where I was.

*Re-cross Examination.*

These boats that I had there did not have sideboards on them, just a flat bottom. Take the paper there, no  
4668 wheels. Take the plank like the two thicknesses of your hand, spike them together, then an iron across each end with a loop on each end, an iron here, and a loop here, and hitch it to three chains to go down and pick it up like this, put a chain on each side, and another one like that and pick them up and when it was loaded with rubel stone, I did not haul them on the ground, laid them down in the quarry, laid the rubel on them, then picked them up with the derrick, swung them up and put them on the little car of the quarry and go to the railroad car and hoist them up and put them into the coal car. As to why I call such a thing as that a boat, I don't know. That is the only name I know for them. They have always been called a scale boat.

4669 AMOS R. BROCKWAY, a witness for the defendant, testified as follows:

*Direct Examination.*

My name is Amos R. Brockway; I am fifty years old and live in Joliet. I have been in Joliet now about twenty-three years. I cannot tell you exactly what year it was I came  
4670 to Joliet. Before I lived in Joliet I lived four miles below Joliet. I lived there until after I was twenty-two years old, along in there. I was born in Will County. I am a livery man at present. I have been in that business for myself about fifteen years.

I know where the Desplaines river is. I see it every day, when I am in Joliet. I am in Joliet most of the time. I see the river in Joliet and I see it below Joliet or above Joliet, just whatever happens to be my way to go. My farm is just about a half mile from the river.

4671 When I was a small boy I was within a half mile of the river. I am pretty familiar with the river clear down to the mouth of the Illinois. I had occasion to see the river down below its mouth because I fished, hunted; I have hauled people up and down there, going fishing, more or less ever since I have been old enough to.

There are rapids or shallows in the river below Joliet, from the old Malcolm Dam down below Brandon's bridge, that is what they call the riffles. Then you have got water, a good deal of water from then down to,—well, just a little this side of Treat's Island. That stretch of the river just below Brandon's bridge down to towards Treat's Island is called 4672 Lake Joliet. Well, the other side of Charley Smith's bridge are riffles and stones. There is a deep hole, and then on down about a mile and a half from there it goes dry; it used to go dry and wash holes, the fish would get in there and they couldn't get out until there would come another freshet. Smith's bridge is about a mile and a half or two miles from Treat's Island, farther down the river.

Below Smith's bridge you find what they used to call the old ford. There are riffles there. There were riffles all the way between, clear across the full width. Up and down the river it probably was a stretch of about three miles. Below that you would come to stone, big nigger heads, I have sat on them along in the fall of the year and fished in the mid-4673 dle of the river. That is down below Charley Smith's, down at the mouth. I was fishing there last year; that was the time I sat on the boulders and fished. In places the water was a little over knee deep; on other places it was not over four inches.

I am familiar with the river below that down the mouth. The condition of the river there with reference to the depth of water and boulders is about the same all of the way. There are boulders there, some of which would weigh five tons. There is lots of them. Most of them are exposed; you can see them stick up. Some of them you can see where the water runs over them. I am referring to the Desplaines 4674 river right at about where it joins with the Kankakee.

You couldn't used to run a boat through there, at Treat's Island, only at certain times a year, *i. e.*, wet times, late in the fall, or— You couldn't run a boat through there excepting in the spring season, because you couldn't run it on dry land. There was not sufficient water. I am referring to a rowboat. There were plenty of boulders in the river at Treat's Island. A stretch of river over from Brandon's bridge up to Joliet is almost a complete bunch of big, round nigger heads and boulders. They are so thick that I would not want to try to take a big one through there. The water between Joliet and Brandon's bridge in the ordinary sum-

mer, in the summer season after the spring freshets are  
4675 over, before the drainage water was discharged into the  
river, would not be over six inches, hardly any place be-  
low that, during the last, the rest of the season.

I am familiar with the river above Lockport. I have known  
it about fifteen or twenty years. I married a woman that  
lived right close to there. I had occasion to go there once in  
a while, before I was married and since. I used to haul people  
up there before street cars went through. We used to haul  
lots of them up there fishing, with the bus, you know. I knew  
the river up there before 1871; I had occasion to visit it fre-  
quently before 1871.

4676 At 9th street, there at Lockport, there was a bridge  
under water—there would not be water enough there for  
anybody to take a buggy over and wash it, maybe three  
months in the year. To take it over there, and further up it  
was very shallow. When you got up to about Fitzpatrick's  
line there, you would find a deep shoal up to Lemont, and  
there where the Santa Fe tracks crosses there never was very  
much water there until the drainage people turned it through  
there; I don't know just what year they turned it through.  
During the season after the spring freshets were over, above  
Lockport and before 1871, it would not average, on an average  
clear through, it would not average 12 to 14 inches anywhere  
hardly. There were places where there was not six inches  
of water, and other places where it was completely dry.

4677 Above Lockport there must be from three to four miles,  
two or three, where there would be only six inches of  
water.

I was familiar with the river below Joliet before 1871. At  
that time, between Joliet and Brandon's bridge, there might  
be some places along in there, in that line, in there that it  
would be probably 8 or 9 feet deep, but it did not run only a  
short way till it was shallow again. There was about four  
miles of it there below Joliet down to the Rock Run that was  
considered pretty deep. Prior to 1871 between Joliet and  
Brandon's bridge, before you get to Joliet, there never was  
any water there to any extent, any certain depth at any  
time, only just in a freshet. Sometimes there was not  
4678 any; it was dry. During the entire season after the  
spring freshets were over, there were some places it  
would not average six inches of water. When I said there  
was deep water, 9 feet deep, I did not—I was not referring  
to that part of the river between Joliet and Brandon's bridge.

The spring freshets, spring floods would usually last in the winter before 1871, a week or two weeks.

I had occasion to observe the river below Lake Joliet before 1871. I fished and hunted there. My folks used to take me down there when I was a little fellow. This Treat's Island used to have a little mound of grapes and gooseberries, 4679 and there was nothing, we could drive right across the river to one island, and down through the other, and by dodging around through the stone you could get there all right.

During the summer season down on the shallows at Treat's Island, the water would not come up to the hubs on the buggy. Along the riffles near Smith's bridge, during the summer season, it might average 8 to 10 inches. I never knew of any navigation being carried on that river for commercial purposes. I never saw anything other than a rowboat on the river. The only other boat that I ever have known to be operated on that river, was a fellow who had a little cannon sticking on to it, and we got after him—with a cannon in the end of it, and we got a lot of rifles and chased him out. That was above Lake Joliet.

I am a liveryman, and have been engaged in that business for about fifteen or sixteen years, for myself. About fifteen. It was along in 1892 or 1893, or 1894 that I commenced. I was a horseman when I left the farm. I left the farm when I was about 22, or a little past. I had become a horseman before that time. I continued in one line of horseman business from that time on. From along about 1892 or 1893 4681 back to the time when I left the farm, I was handling horses, and around stables; kind of a hostler, a little of everything. Last year, as late as last year, I was down fishing down there in the river, and sat on the cobble stones, or whatever kind of stone there may have been, sat on them and fished in the river. The water was not to exceed four inches deep. I was fishing for suckers; that is where suckers will be caught, and good bass, in shallow water. This was only last year.

Q. Don't you know that the drainage water, the water from the drainage canal has been turned in for about eight years?

A. Not down in the Illinois river, it ain't.

Q. It does go down there, doesn't it?

A. If it did, I haven't seen it; that is where I sat on the stone right near where this dam is being built too.

4682 Q. In the Illinois river?

A. Yes, sir. It was about 40 or 50 rods below where this dam was being built.

Q. And this water from the drainage canal didn't come down there?

A. I didn't see any of it.

Q. Where do you think it went? Up the Kankakee river?

A. It might.

The WITNESS. There was one fellow duck hunting with a cannon, in about 1883. He had a rowboat, a great, big one, a longer one than unusual, and he had a gun on a swivel in the bed of it, you know, and he would get down and sight that on a flock of duck, and it was good-bye to the whole flock.

Q. How far could he get them, one, or two or three or four miles?

A. Well, I will tell you: I will tell you: I remember  
4683 one day I was about half a mile below him, and it got so hot in the weeds where I was, it was too many bees for me.

4689 THOMAS T. JOHNSTON, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Thomas T. Johnston. I am in my fifty-second year. I reside in Evanston, Cook County, Illinois. My occupation is that of a civil engineer. I graduated at the Rensselaer Polytechnic Institute at Troy, New York, in 1877. On the 1st of January, 1878, I entered the service of the United States Engineer Corps, in which I remained until June of 1886. In the first half of 1878 I was connected with the  
4690 improvements about the Washington monument in Washington City, the work at Washington being particularly with reference to the making of the Babcock lakes in the Washington monument grounds, together with their outlet, lakes and drainage.

In July, 1878, I was assigned to duty on a survey of a portion of the Upper Mississippi between Lynchville, Wisconsin, and Savanna, Illinois. In December of the same year I was employed on a short survey on the Missouri river at Atchison,

Kansas, and on July 1, 1879, I was assigned to the charge of what was called an observation party on a reach of the Lower Mississippi about 70 miles below Cairo, the reach of the river including a distance of about 40 miles, the duties being to survey and resurvey the reach of river with a view to determining its hydraulic elements. These duties and assignments were all under the Federal Government until June of 1886.

4691 In the summer of 1879 I spent July and August on the snag boats at Mound City, Illinois, reducing the notes of the surveys of the previous several months.

In September of 1879 I was assigned to a survey of the Gasconade river in Missouri, which work engaged my attention until in December of that year.

In the winter, the early winter of 1880, I was in the St. Louis engineer's office, writing up the notes of the survey of the Gasconade river, and was assigned from time to time to miscellaneous duties in connection with the study of the physical characteristics of the western rivers.

In the summer of 1880 I was assigned to the charge of making a survey of the Missouri river in the vicinity of Yankton, Dakota, and of Running Water, Dakota, or Niobrara, I think it is called.

In the fall of 1880 I was assigned to the river improvement work on the Gasconade river in Missouri, of which I had charge of making the survey the previous year, and that engaged by attention until December of 1880.

On returning from the Gasconade river to the St. Louis office of the engineer corps, I was assigned through the first nine months of 1881 to work in connection with the study of the

physical characteristics of the western rivers, incident-  
4692 tally in that spring making an inspection of the Missouri river from Sioux City to its mouth, with reference to the effect of a considerable flood that occurred in the spring of 1881. In the fall of 1881 I was assigned again to improvement works on the Gasconade river, which engaged my attention until the last of the year.

In the beginning of 1882 I returned again to the St. Louis office of the United States Engineer Corps.

Through the year 1882 I was on duty in the St. Louis office in relation to the study of the physical characteristics of the western rivers as in previous years, and in the latter part of that year my attention was turned particularly to the effects of the large flood in the Lower Mississippi in 1882.



In 1883 until the middle of the year I was engaged in the same duties as through the year 1882. In the fall of 1883, and until the end of the year I was assigned to duties in connection with improvements on the Missouri river at St. Joseph, Missouri.

January 1, 1884, I was recalled to the St. Louis office 4693 and from that time until June of 1886 my attention was given exclusively to the continued study of the characteristics of western rivers. In the course of that work I had to do with a good many thousands of gauge readings, a thousand or two measurements of the flow of the western rivers and incidentally studied the question of rivers in general.

In June of 1886 I was given a position with the Chicago Drainage and Water Supply Commission, as assistant engineer with—as stated in their report, with particular reference to miscellaneous work and water supply. I remained with that commission until it went out of existence in the summer of 1887. In the course of my connection with the Drainage and Water Supply Commission, I devised the methods by which the Chicago Drainage Canal was afterwards dimensioned.

In February of 1887 I conducted the measurement of the flow of the Desplaines river at Riverside, Illinois, locating the position at the point at which the measurements were made, and the methods by which they were taken.

In the summer of 1887, as the Drainage Canal Commission or the Drainage Water Supply Commission went out of existence, I was continued in the service of the city as assistant engineer with reference to its water supply until May 4694 of 1888.

In May of 1888, I was given the position of chief engineer of the water supply at Memphis, Tennessee, and at that time devised the scheme that has since supplied that city with water, and I also, as an engineer, constructed the works during the years of 1889 and 1890—I mean, 1888, 1889 and the early part of 1890, at a cost of some six hundred thousand dollars.

The first of April, 1890, I was given a position with the Chicago Sanitary District, and my attention was engaged on that work exclusively until December of the same year, at which time I resigned; but in the course of that year's work my attention was quite largely devoted to a continuance of the processes of and an investigation—of the processes by which the Chicago Drainage Canal was afterwards dimensioned.

On leaving the service of the Sanitary District in Decem-

ber, 1890, after doing a little piece of work for the Board of Health of the State of Illinois, I took charge of the water supply of Savannah, Georgia. That was early in 1891, and as an engineer I devised the works which have since supplied that city with water and supervised their construction during the years 1891, 1892 and the first half of 1893, acting as consulting and supervising engineer.

In the summer of 1891, I was recalled to Memphis as consulting engineer in relation to an extension of that water supply, the doing of which occupied the following year or fifteen months.

In January of 1892, I was recalled to the service of the Sanitary District of Chicago and remained continuously in that service until the first of July, 1900, as assistant chief engineer, at times acting chief engineer, and during the last two years, or from August, 1898, until July, 1900, I was consulting engineer. In the course of my duties with the service of the Sanitary District, I had to look after the hydraulic elements pertaining to that work. It was a part of my business to keep myself posted as to the habits of the Desplaines river. In the course of that work, besides making those investigations and determinations which lead to the dimensioning of the Drainage Canal, I also made investigations and devised the arrangements at the terminus of the Drainage Canal at Lockport, including the sluice gates and the bear trap dam. I also made those investigations which lead to the dimensioning of the river diversion of the Desplaines river from Summit to Lockport. I made investigations and examinations or determinations which lead to dimensioning the work of the Sanitary District through Joliet, and I reported to the Board of Trustees of the Sanitary District the project for the improvement of the Chicago river.

In 1895, I was consulted again in relation to the water supply of Memphis, Tennessee, and in the year 1898 I acted throughout that year as consulting engineer for the water supply of Memphis, Tennessee.

Early in 1898 I undertook as the engineer the plans and constructions of the Snoqualime Falls Hydro-electric Power Company in the State of Washington. I devised the plans for that work, and as consulting engineer, supervised the construction. I remained with that work until July of 1890, two and a half years.

In the summer of 1898 I was engaged by the Economy Light & Power Company of Joliet in relation with the construction

of their work at the Jackson Street Dam in Joliet, and through Joliet, excepting for a period when I withdrew from the service when litigation was pending; I served 4697 through 1898, 1899, 1900 and 1902, the first work having been completed by the end of 1900, and the second work undertaken in 1902.

In the year 1901—in the fall of the year 1901, I was recalled again to Memphis, Tennessee, as consulting engineer and served continuously from that time in that capacity until the first of the present year.

In 1901 I also understood the design and construction as engineer of the Swan Falls Hydro-electric Power Plant on Snake river, some thirty miles from Boise, Idaho. The work done at that time occupied about a year, at a cost of about \$350,000; and at about the same time I was consulted in relation to water power development at American Falls on the Snake river near Pocatello, and also on the Payette river about twenty miles north of Boise.

In 1901 I also undertook the remodeling of the hydro-electric water power plant at Kankakee, Illinois. In that year, the next year, and I think the next year succeeding that I was retained by the electric power plant there, and in the last year rebuilt the dam across the Kankakee river at that point. 4698 That was in about 1903 or 1904. I think it was 1904 we built the dam. It was in the last year that we built the dam.

In the summer of 1903—or rather first in the winter of 1902-3 I made plans for and supervised the construction of the masonry aqueduct across the Pecos river in New Mexico; also made an examination of the Gila Bend irrigation project on the Gila river, Arizona.

In 1903 I undertook the design and construction of the hydro-electric power plant built by the Oliver Chilled Plow Works at South Bend, Indiana. That work occupied all of 1904 and part of 1905.

In 1904 I undertook the construction of the hydro-electric power plant for Mr. Conn at Elkhart, Indiana, and was consulted at that time and before and since in relation to a number of water power plants in Central Wisconsin, and also one in New York State on the Oswego river.

In 1905 I undertook the extension of the hydro-electric power plant on the Snake river near Boise, Idaho, and was connected with that work through all of 1905.

In 1906 I repaired and practically rebuilt the dam on Black river near Cheboygan, Michigan.

In 1907 I acted as consulting engineer in relation to a hydro-electric power plant on the Rainy river, in Wisconsin.

At the present time in this year I am doing some work 4699 for the City of Chicago in relation to its water supply.

In the course of my work I had made plans for and supervised the construction of the Summit spillway for the Chicago Drainage Canal; Dam Number One at Joliet for the Chicago Drainage Supply; a dam across the Snoqualime river in the State of Washington; a dam across the Snake river in the State of Idaho; a dam across the Kankakee river in the State of Illinois at Kankakee.

I have remodelled and repaired the dam across the St. Joseph river of Michigan at South Bend, Indiana; across the Black River at Cheboygan, Michigan; across the Rock river, Beloit, Wisconsin; and I have examined in one way or another in a professional way dams at Oswego, New York; Holyoke, Massachusetts; the Davis Island dam across the Ohio river below Pittsburg, and the next dam below that across the Ohio river, I believe that Beaver Dam, it is so-called; the dam at Three Rivers on the St. Joseph river in Michigan; Constantine on the St. Joseph river in Michigan; Elkhart, Indiana, on the St. Joseph river; at Mishawaka, on the St. Joseph river in Indiana; at Waldron on the Kankakee river in Illinois; at Kankakee on the Kankakee river in Illinois; a dam in the vicinity of Wilmington on the Kankakee river in Illinois; the old dams Number One, Number Two and Adam's Dam in 4700 Joliet; the dam across the Illinois river at Marseilles; the dam across the Rock River at Sterling; across the Fox river at Dayton; across the Fox river at Elgin; across the Chippewa river at Eau Claire, Wisconsin; across the St. Croix river, about forty miles from St. Paul; across the Kaushawa river in Northern Minnesota; across the Rainy river at Koochening, Minnesota.

I have also inspected, but not in a professional way, the dam across the Mississippi river at St. Paul; a dam across the Pecos river in New Mexico; across the Gila river about thirty miles from Phoenix in Arizona that I recall now.

I have also examined a number of rivers in different parts of the country with regard to their habits in relation to water powers and dams of which I have just spoken, and have also had to do in a professional way with the earthen embankment on the river diversion of the Drainage Canal, along the banks

of the Illinois and Michigan Canal; to some extent with the levees in the Lower Mississippi; in improvements in relation to the irrigation work at Carlsbad, New Mexico, and with regard to the engineering—the irrigation work to a certain extent near Boise, Idaho, and the reservoir dam at Seattle, Washington.

4701 The last one I mentioned was the reservoir wall, or reservoir embankment at Seattle, Washington. The first reference made to the Desplaines river was 1887. I had supervision over the gauge readings of that year, but I stated that I had charge of the making of the flow measurements of the river at Riverside in the fall of 1887. I cannot state from personal knowledge who established the gauge at Riverside. It was established in 1886.

When I was connected with the Economy Light & Power Company in 1902 I think was the last work I did on the Desplaines river. I had occasion to examine the river with reference to the drainage in the case of the Sanitary District against Adams, where I appeared as a witness for the

4702 Sanitary District. That was a condemnation suit, the Sanitary District condemning the dam. The purpose of that proceeding on the part of the Sanitary District was in part to show the character of the river. I made an examination at that time. I don't remember the year of my first experience with the river. I suppose it must have been about 1894, 1895, not far from that time.

I had particular charge of the collection of the gauge readings during the time that I was connected with the Sanitary District of Chicago. That covered in all about nine  
4703 years. I had immediate supervision over the collection  
4705 of those gauge readings in my service with the Sanitary District in the year 1890, and from January, 1892, until July 1, 1900. In the period of 1890 Mr. Cooley was my superior officer and I reported to him.

I know what relation the regularity of the recurrence of certain stages of water has to do with the possibilities of navigation of the stream in which the water flows. As  
4706 to stages of the river when it might, under certain circumstances be navigable, recur with irregularity as to time and extent, then in a measure the feasibility of navigation is diminished.

As to what gauge readings I have considered with reference to determining the regularity of the flow in the Des-

plaines river, in addition to those made under my own  
4707 supervision, I examined the gauge readings reported  
for the Desplaines river between 1896 and 1904 inclusive, as published in a government document entitled "59th Congress, First Session, House of Representatives, Document No. 263." I have carried my examination of the gauge readings down until the end of the year 1904. The period when I had supervision over the collection of the gauge readings was immediately preceding this.

Including the year 1886, when I did not have in so high a degree supervision over the gauge readings as I did subsequently, they extend from the beginning of the record of that gauge in 1881, down to the end of the year 1904.

Q. Mr. Johnston, I wish you would state the result of your investigations, as to the times when a stage of 12.4 feet was recorded during that period, with special view as to the regularity of the recurrence of that condition.

COUNSEL FOR COMPLAINANT. To that I object. We had to produce the gauge readings and put them in evidence ourselves.

4708 The COURT. Overruled.

COUNSEL FOR DEFENDANT. In your answer state also what 12.4 feet mean so far as the water in the river is concerned.

A. 12.4 feet on the Riverside gauge corresponds to a flow of 305 feet per second approximately, passing through the river at that point, and to a stage of the river one foot above the stage at which the flow ceases, or becomes so small as to be of no significance in that period of time. In the period beginning in 1886 and terminating early in 1896 as tabu-  
4709 lated—I have tabulated the results, with the results as follows: That in the month of January the record was complete for six years, and that twice in this period the month of January showed an average flow of 305 cubic feet per second or more.

Thereupon objection was made by counsel for complainant that the witness was reading from a memorandum, whereupon counsel for defendant agreed to have typewritten copies of same made and given to counsel for complainant. The witness continued reading.  
4710 The record was complete for the month of February seven years, and four times the flow reached 305 cubic feet per second or more.



In March the record is complete for seven years, and the flow before stated was reached or exceeded six times.

In April the record is complete for six years with a recurrence of the flow as before described four times.

May, six years, recurrence of the flow three times.

June record complete seven years, recurrence of the flow three times.

The July record complete seven years, a recurrence of the flow two times.

4712 COUNSEL FOR COMPLAINANT. I only want to know whether the witness in giving these dates means so many days in each of these months. I do not understand the answer.

I want to know, Mr. Johnston, whether these days you are giving are the days for each month of each year or not? You speak about the seven years in your answer, and that confuses me so that I don't understand what you mean. Do you mean now, so many days for the month of March each year for the seven years, or during the month of March for a certain year or the month of April. If you will kindly make that clear to me I will be obliged?

A. I referred to the whole month in each year. The period covers some nine years and the records were not complete in every month of every year, and I was stating the number of months first in which the records were complete for the whole month, and then—

The COURT. That is, the number of months—the number of Januaries, in those nine Januaries in which the record was complete for the whole month?

A. Yes, sir.

4713 Q. That is, there were six Januaries out of the nine in which there were complete records for the whole month.

A. Yes, sir.

Q. For every day of the month?

A. Yes, sir.

COUNSEL FOR COMPLAINANT. And you are giving the number of days now in each of these Januaries, or the average for these Januaries, during these seven years.

A. No, sir, I am giving the number of times that the average flow for January reached or exceeded 305 cubic feet per second.

Q. In the six or seven years as the case may be?

A. In six or seven years as the case may be.



COUNSEL FOR COMPLAINANT. That would mean two Januaries out of the period?

A. Yes, sir.

Q. The whole of the month of January?

The COURT. Q. You mean twice during the entire month of January or on a number of days in all of the six Januaries, that would be in the number of days, in a hundred and eighty days—

A. No, sir, it would be the average for January twice.

4714 Q. The average that is, of the six—two out of the six—two Januaries out of six show an average of 305 or more?

A. Yes, sir.

COUNSEL FOR COMPLAINANT. For a month, your Honor, as I understand it, not the days in the month, but for the month?

A. For the month.

The COURT. Q. For the entire month?

A. The flow of the month divided by the number of days.

Q. By the number of days in the month?

A. Yes, sir.

COUNSEL FOR COMPLAINANT. Now, go on.

A. The August record complete in eight years, in no one month or at no time rather, did the flow occur as before described; and also in September the record was complete for eight years and in no one month of September did the flow average as much as before described.

For October the record was complete nine years, and the flow above described recurred but once.

In November the record was complete for eight years, and at no time did the flow above described recur.

For the month of December the record was complete five times, and the recurrence of the flow only once.

4715 In a total of 84 months—I should have said five years

—The record was complete for 84 months in this period and in 26 of those months the flow averaged 305 cubic feet per second or more. Thirteen times the average flow of 305 cubic feet per second or more occurred in 25 winter months, the winter months being December, January, February and March. The other 13 times occurred in 59 summer months. Four times it recurred in two consecutive months and only once for three consecutive months during the eight summer months. That answers the question as far as the record of the average readings goes, as before stated.

The COURT. That is, out of 25 winter months the river 13 times reached 305.

4716 A. Four times in the period in the summer months with the flow recurring two months in succession; once it recurred three months in succession.

The COURT. Q. Never oftener?

A. Never oftener.

I have made a further tabulation from the gauges—this covers the period when I had supervision of the—although in the record of 1886 I did not have the supervision over it in as high a degree as I did subsequently.

I have examined the gauge readings at Riverside as printed in congressional document entitled "59th Congress, First Session, House of Representatives, Document No. 263," for nine years, 1896 to 1904, inclusive. The record is given complete in all these months, in all of the months for all of these years, and I have taken and picked out those months in which the gauge readings average 12.4 feet or more on the 4717 Riverside gauge, which would correspond to a flow of 305 cubic feet per second or more. In this table, the record being complete for each of the nine years, the average gauge reading 12.4 feet recurred in two Januaries; six times for February; eight times for March; eight times for April; twice for May; three times in June; twice in July; no times in August; twice in September; once in October, twice in November and once in December, a total of 108 months, and the average gauge reading of 12.4 feet recurred 37 times in that period, of which 17 times were in the four months and 20 times in the eight summer months.

That is for nine years next succeeding the period that I have testified to in the other table. Four times this average gauge reading recurred two months in succession, and once three times in succession. There never was a period when it occurred for more than three months in succession in the summer months.

In all the years where these gauge readings are shown there are certain months when no water passes the gauge. Of 4718 a given month in each of these years there will be times when no water passes the gauge; either that—that is absolutely true, frequently, but very frequently when there is either no water flowing or the quantity is so small as to have no significance.

The COURT. Q. you mean so small as not to be recorded on the gauge?

A. Yes, sir, as not to be measurable on the gauge of the river.

4719 The gauge most all of the time has been a staff gauge.

At one time there was what was called a self-recording gauge, established at Riverside, at the site where the staff gauge is located, something like a quarter or a half mile from the railway station at the bank of the river. The staff gauge is a piece of wood perhaps four inches wide and three-quarters of an inch thick, upon which are marked the distance of feet and fractions of feet. That is fastened to a post or nailed to a tree or otherwise, held in position so that one extremity of it is always in the water, the site being chosen where the bed of the river is a little lower than in other places, so that if there is no water at all in the river, the end of the gauge would still be under water. The gauge readings taken

on the gauge indicate—the reading on this rod or staff  
4720 where the water surface at any time may happen to be,

having all of the gauge readings at a given gauge, the readings have a relative significance as to the river being higher or lower. It is the engineer's object to run levels and determine where the elevation of the mark of zero on that gauge would be with reference to some datum which is in common use in the region for making those references, as for instance, Chicago datum. On that gauge the point of no flow is marked about 11.3 above Chicago datum, or very closely that.

Those figures that I have been giving are on 12.4 feet, I have run on that gauge. The zero of that gauge had reference to Chicago datum, and a reading on that gauge corresponding to no flow would be 11.3, very close to that.

When the water was 12.4, it would be 1.1 foot deep, about a foot and  $1\frac{1}{4}$  inches.

COUNSEL FOR DEFENDANT. Q. Now, as I understand you, the gauge is set in a hole or place steeper than the ordinary bed of the river, so that water will be flowing over it in  
4721 days that it would not in the ordinary bed of the river, is that right?

A. Standing around the gauge even if there was no flow in the river.

The COURT. Q. You record all measurements then above the zero, do you?

A. Yes, sir, above the zero of the gauge.

The first reading on the gauge is the lowest reading ever contained in the record. The gauge would be 11.3 feet and none of the readings below that point would be noticed.

The COURT. Q. 11.3 would reach the minimum?

A. That would correspond to no flow.

The COURT. Q. What is it you say as to the zero of 4722 the gauge in reference to Chicago datum?

A. In this case it is Chicago datum.

Q. And then what is your—how many inches did you say?

A. 11.3 feet.

11.3 feet in relation to that river is simply at the point to be marked on that gauge at which no flow takes place. That means no water or not enough water to be measured on the gauge. That is not enough water to flow, or to raise the river above a level corresponding to no flow in any degree that can be measured. For instance, a one-hundredth of an inch could not be measured or would not be measured. When there is no flow of the river, that means that except in pools the thing is dry, that you could walk across the stones, walk across the bottom of the river without wetting your feet unless you stepped into a pool; usually means there would be points where you could cross—

COUNSEL FOR COMPLAINANT. That would depend on the slope of the bank?

4723 The COURT. I am asking him whether the elevation of the bed at this Riverside gauge is this level of 11.3 feet above Chicago datum.

4724 As to whether that gauge is on a level at zero with the bar would say, no, the zero of the gauge is considerably below the bar, ten or eleven feet. The lowest reading that the water reaches on that gauge reads 11.3. 11.3 feet on that gauge is on a level with the crest of the bar; yes sir. Zero is Chicago datum. 11.3 on that gauge which is to represent the beginning of the flow of the river is on a level with the crest of that bar that forms the border of the pool into which the gauge measurement, the gauge stick is placed; on a level with the lowest point on the crest of that bar. I mean 4726 the lowest point over which any water can flow.

COUNSEL FOR DEFENDANT. What I want to get at and the question we started with was whether in each month in each year of the nine years that you have a record whether or not there were times in such months when no water flowed over the bar?

A. Yes, sir.

Q. That is, in each month in each year of the nine years there were times in such months when no water went over the bar, is that correct?

A. Well, that is not the way I understood the question before. That may or may not be entirely true.

The COURT. Q. That would depend upon the daily readings and you have not given us that? You have only given us the average for the month?

A. That is all, and I do not know whether I am prepared now to answer that question.

4728 The court then held that the 1905 Government Reports already introduced in evidence were the best evidence.

The WITNESS. I spent a considerable portion of time in studying the habits and characteristics of western rivers. That was for the Government of the United States. The object of the studies was to devise processes and ways in which to accomplish river improvement. I took notice of the habit of the river for that purpose, in fact.

Q. What, Mr. Johnston, if you know, are the elements to be considered in determining whether or not a river is navigable in fact.

4729 COUNSEL FOR COMPLAINANT. I think this is cross-examination.

The COURT. No, I think not. He may answer.

A. The quantity of water that may flow in a stream, the extent of the boundaries of the stream, or in other words its confines; the regularity with which different stages of the river may recur, whether they recur in periods when the river can be navigable or when it cannot be navigable on account of ice, and also the declivity of the river in relation to the narrowness of its confines and the declivity constitutes I believe in general the elements that would be called for by the question asked. The character of the bed, whether rocky or sandy, or of boulders would be an element also.

I am familiar with the Desplaines river for about all of its length from its headwaters to the junction with the Kankakee river.

Q. Will you state whether or not in your opinion the Desplaines river is navigable for the purposes of commerce?

COUNSEL FOR COMPLAINANT. That we object to, if your Honor please. It calls for an opinion and for his opinion, not on the case stated, but on facts not stated, because there  
4730 is no foundation for his opinion as an expert in navigation, and the answer is irrelevant, incompetent and immaterial.

The COURT. He may answer.

A. It is not.

COUNSEL FOR DEFENDANT. Q. Has it been at any time since you have known it?

A. No, sir.

COUNSEL FOR COMPLAINANT. I object. I suppose it may be taken that the objection as made to this first question may stand to all questions without repetition.

The COURT. Yes.

Q. Why in your opinion is it not navigable?

A. The upper Desplaines River above Riverside is not navigable because of the small quantity of water that flows in it most of the time; also on account of the narrow confines of the river bed; also of the irregularity with which certain stages of the river recur when it otherwise might be navigable, when they recur with reference to time and extent; also because the recurrence of those periods when the river might otherwise be navigable is for so much of the time in the winter months. The river between Riverside and Lemont in what is known as the twelve mile level would not be navigable for these same reasons, except as to the narrowness of the confines of the river. The river from Lemont to its junction with the Kankakee would not be navigable for all of the reasons which apply to the upper Desplaines above Riverside, and in addition because of the declivity of the river being in general so steep and the nature of its bed so sinuous and rocky or obstructed by boulders in a degree that would render its navigation dangerous.

The declivities extend from Lockport to Lake Joliet, a distance of about eight miles, approximately that. The fall from Lockport to Dam No. 1 is about forty feet, in four and a half miles. From there to Lake Joliet, a distance of about three and a half miles, the fall is twenty-one feet. To Lake Joliet, a distance of approximately five miles, there is no fall at low water. At the foot of Lake Joliet down through Treat's Island for a distance of a mile the fall is about nine and a half feet, and then a distance of about a mile with no fall, and a distance of another mile with two and three-fourths feet fall, and a distance of about three miles with about two feet of fall, and then a distance of half a mile with about three feet fall. The bed of the river at that point is of boulders. The current is very rapid. It is south of where the Economy Dam is being built.

Between Dam No. 1 and Lake Joliet the minimum width of the river, before the drainage water was poured in, was perhaps sixty feet. The character of the bed of the stream there

would be, barring a little dirt on the surface of the bed of the stream, rock and boulders. There were islands below the old Adam Dam, from there to Lake Joliet. The characteristics of the islands,—are principally of boulders, with some dirt and maybe a little brush growing on them. The bed of the stream was usually of boulder formation.

The river at Treat's Island was split up by islands with channels irregularly passing through them with a rapid current passing in the channels, which were perhaps a hundred feet wide, or such a matter; and its sinuosity was quite crooked. There were boulders there. What the slope may be would depend something upon the distance or the length of the river taken into consideration. The slope of the river in general from Dam No. 1 to Lake Joliet, is about eight feet to the mile, but at places in that reach of the river the declivity would be quite a good deal more precipitous, say in a distance of 100 feet or such a matter.

4734 The general fall at Treat's Island in that region was in a mile there say about nine and a half feet; some places in a distance quite a good deal more, some less. The maximum slope there per mile was I would judge, from having looked at it without measuring it, it might run say to fifteen or even twenty feet per mile for a short distance.

Thereupon counsel for complainant moved to exclude it, on the ground witness did not measure it and does not know and puts it in as a guess.

The COURT. It may stand.

COUNSEL FOR COMPLAINANT. If the court please, where a man is put on as an engineer to give measurements and says "I do not know, I just looked at it"—

The COURT. It stands only as an estimate, according to his statement.

The WITNESS. As a rule points of steep declivity become drowned out as the stages of the river rise.

4735 Q. Would it be true then that a river which retained a higher stage or a high water stage for a considerable period might be navigable even though its slopes were very steep?

COUNSEL FOR COMPLAINANT. To that I object, your Honor, as suggestive and leading and improper generally, I think.

The COURT. He may answer.

A. That is true.

The WITNESS. The Desplaines in the neighborhood of Riverside, at the Riverside gauge, would not be affected at all or



could not have been affected by the deep cut, the diversion of the Desplaines, the deepening of the Illinois and Michigan Canal, or the building of the Sanitary Canal or the Ogden ditch,—because the Riverside gauge is at an elevation above the field of influence of the causes I have just named.

The construction of the Illinois and Michigan Canal opened in 1848, with special reference to the question of percolation, would not, in my opinion, have any influence on percolation from the Desplaines river. It would not affect at all the discharge of the Desplaines river, in so far as percolation is concerned. In cutting off a part of the drainage basin of the Desplaines river south of the Illinois and Michigan Canal, it would have some influence, but a very little, because the flood waters from the region in question would naturally run off in the earlier periods of any rise in the river and be gone before the low waters from the head waters of the stream would come down.

The character of the river is that they rise generally very quickly and subside with greater or less rates of rapidity. The higher stages subside quite rapidly as a rule.

The flow of the extreme maximum to midstate would ordinarily diminish within the record within three or four days, and a rise of that kind, without any supplemental flow of water from another point would ordinarily have flowed off in that time.

4737 The cutting of the Chicago Divide in 1852 near Kedzie avenue had the effect of causing the waters of the river to flow away somewhat faster than they would have done naturally, to the extent that the reservoir capacity in the Mud Lake District was destroyed. The extent to which that influence would be exerted would depend upon several considerations, particularly the rate at which the river might naturally be subsiding; but taking that influence in connection with the other similar influence in the other twelve mile level, and the influence of cutting off the basin or that part of the basin south of the Illinois and Michigan Canal, and the influence of the Ogden Dam, and summing them altogether, the duration of the low water stages would not in my opinion be affected by the presence or absence of those influences by more than ten per cent. at any time.

4738 In my opinion the deepening of the canal in 1866 and 1871 did not have any effect upon the amount of water discharged into the Desplaines river.

The river diversion of 1892 and 1894 eliminated substan-

tially the reservoir capacity of the twelve mile level to which I have already referred.

The opening of the Sanitary Canal in 1900 had no  
4739 other effect than what was involved in the drainage canal,  
in the river diversion, except one.

4765 In my opinion the combined influence of the causes  
heretofore referred to would not exceed—would be such  
that the presence or absence of those causes would not affect  
the duration of the low water flow more than ten per cent. at  
the time.

Q. Now, Mr. Johnston, what if any effect did these works  
have upon the water in the Desplaines below the point of dis-  
charge of the Illinois & Michigan Canal, taking into account  
the water delivered into the river by that canal as compared  
to the addition which the canal made to the water of the Des-  
plaines below the point where it entered into that river?

4766 COUNSEL FOR COMPLAINANT. To that I object. Before  
he answers I would like to have that point located by  
some physical object if it can be done.

COUNSEL FOR DEFENDANT. All right, locate on the map  
where the canal discharged into the Desplaines.

The Summit level of the Illinois and Michigan Canal ex-  
tends from Bridgeport in Chicago to Lockport, Illinois, as in-  
dicated on Woermann's Exhibit 4.

The particular location of the first lock does not appear  
to be shown on this map, but in any event it is in the Village  
of Lockport, as I understand the boundaries of the village.

The effect, prior to the making of what is known as  
4767 the deep cut in the canal, which was made in the latter  
sixties and early seventies, mostly the latter sixties, I be-  
lieve was to augment the flow of the Desplaines river below  
Lockport to the extent that water was fed into the Illinois and  
Michigan Canal from Lake Michigan, or from the Calumet  
Basin through the so-called Calumet feeder.

Q. How did that amount fed into the canal and thence into  
the Desplaines river compare with any loss that the Desplaines  
river may have suffered by reason of the works that we have  
recited in the previous examination?

To which question counsel for complainant objected  
on the ground that the question assumes a state of facts  
to exist of which there is no evidence, and for which  
the evidence of this witness affords no foundation, and  
does not connect with what the witness has been saying  
at all; and that the question calls for a summary of

events without giving the elements that make it. In other words, it is a conclusion of the witness without giving the facts upon which it is based.

The COURT. Overruled.

4768 Thereupon follows colloquy of counsel as to the right to have the witness summarize all the various causes.

COUNSEL FOR COMPLAINANT. My point if your Honor please, is a little bit different. The witness says that the canal feeds into the Desplaines river at Lockport. If I understand his answer, that is what he means. Is that what you mean?

The WITNESS. I have seen it doing so, yes, sir.

4769 COUNSEL FOR COMPLAINANT. I asked when the question was first put that the point of in-take from the canal into the river, and the point of outflow from the river to the canal, be fixed so that we could know what it was he was referring to.

The COURT. I must have been distracted when you asked—talking to the bailiff. I didn't hear it.

COUNSEL FOR DEFENDANT. Read Mr. Starr's statement.

(Statement of Mr. Starr read as follows: "Before he answers I would like to have that point located by some physical object if it can be done.")

The COURT. The witness may testify, may point out the point of in-take and outflow that he is referring to.

COUNSEL FOR COMPLAINANT. You say the in-take from the canal into the river was within the limits of Lockport? Where is the point of outflow?

4770 The WITNESS. As I said, it is not indicated clearly on this chart. It is at—as I have seen it discharged, at the four mills at Lockport, what is called the basin.

COUNSEL FOR COMPLAINANT. That is, the canal into the river?

A. From the canal into the river. The point of in-take of the water were at the south fork of the Chicago river, and also from the Calumet feeder at the point known as Sag on the line of the canal.

4773 From the time, 1848 up to the time the deep cut was made, the canal was fed in greater or less degree at the Bridgeport end of the canal in Chicago. At certain times, it being fed for navigation purposes, and at other times at the instance of the City of Chicago for purposes of drainage. And while the—I am unable now to lay my hands upon the records of the pump operations there, but I have in the past read them, and in my opinion, in the light of those records, there were times when the effect of the addition of Lake Michigan

water and the Calumet river water to the canal must have considerably exceeded any losses that were due to the causes to which I have already testified. As to the particular length of those times, I am unable to state now, but there were 4774 such times and I think of quite a little period.

When the deep cut was made it had the effect of allowing water to flow back rapidly from the Chicago river through the Illinois and Michigan Canal to and below Lockport.

The quantity of water fed through the canal due to the deep cut was in excess of that which could have been due to the loss, as to which I have testified. The proportion was, I should say, may be eight or ten times as much excess, taking it through a period from the time of the deep cut down, say, until 1900.

4775 The data pertaining to the capacity of the canal at the time of the deep cut, Chicago river datum, indicated a flow of about 12,000 cubic feet a minute by gravity.

Counsel for complainant objected on the ground that the witness was being asked for the bald statement of fact which, in the nature of things he knows only from having consulted records of some kind or other, without the disclosure of those records.

4777 The COURT. What are the records that you base this statement on?

The WITNESS. I have read all of the reports of the city engineer of Chicago, from back in the '50's, I think, as early as 1855, down to the year 1900. I have looked up at the reports of the Illinois & Michigan Canal in connection with my services with the Sanitary District, and I have calculated the flow of the water through the Illinois and Michigan Canal at different stages from its normal slope and depth, and at certain times I have conducted and directed measurements of the flow of water in the Illinois and Michigan Canal.

Q. What are the records on which you base your statement of 12,000 cubic feet?

A. The specific records on which I base that 12,000 cubic feet per minute I do not recall now, but I recall the amount from an examination that I have made in connection with my services with the Sanitary District to acquaint myself with the capacity of the Illinois & Michigan Canal.

The COURT. I will let it stand.

4778 The WITNESS. The pumps were not used after the making of the opening of the deep cut, until the pumps started in 1884 by the City of Chicago at Bridgeport.

Q. And what, if you know, did they add to the volume going down the canal?

To which question counsel for complainant objected on the same ground urged in the last objection,—which objection was overruled.

A. The operation of the pumps subsequent to 1884 were not absolutely continuous, but through a large portion of that time a portion of the pumps came under my personal observation from the year 1887 along down to the year 1900, and judging by my personal experience with the operations of those pumps and the observation of them and such records as I had access to subsequent to 1884, I should say that the average flow, of all of that period pumped into the canal by the Bridgeport pump was not far from 30,000 cubic feet per minute, although at times the amount pumped has reached as high as 40,000, possibly 45,000 cubic feet per minute. I have conducted measurements of the flow at one time within my recollection now near Willow Springs, and found a flow, as I remember it now, of 632 feet, which is like 40,000 cubic feet per minute.

I know about what amount should have been taken out of the river by the canal at Jefferson street for the purposes of navigation. I investigated that subject two years ago to some extent for the Illinois and Michigan Canal Commissioners. The provision of feed water on that level so far as navigation was concerned, could not, in my opinion, be over 150 cubic feet per second, which would be 9,000 cubic feet a minute as a maximum. I have observed the stage of water, the depth of water of the Desplaines river in its various portions during the period exclusive of the spring freshets, and as it existed prior to the year 1900 when the Sanitary District turned in its water. The depth would vary from that which existed in its deepest pools, to at times nothing on the bars. I have seen the bars in the 12 mile level without any water on them for a considerable period.

I have seen the same thing at about the same time in other parts of the stream from Riverside down to Lemont and Lockport. The particular place that I have in mind now where I noted the pool of the river between the bars had evaporated so that the crest of the bar stood quite a distance above the level of the water, was opposite what was known as Section 2 on the Chicago Drainage Canal, a mile or so above the crest of Willow Springs.

I have seen the river above Riverside, not at the time 4781 of the spring freshets, and have observed its condition as to the stage of the water. I do not remember ever having seen it dry. I have seen it along its course, along up to Libertyville, at times when the river was very low. It may or may not have been dry at the time I saw it. I did not charge my mind particularly to note.

The flow of the Desplaines river prior to 1900 for an average of 7 or 8 months of the year, would be, as I would express it, as being not significant; that is, the quantity of flow would not be a determinative quantity by reading the gauge at Riverside.

I have observed the depth of the river below Lockport prior to 1900 outside of the period of spring freshets. I do not remember now seeing the river at any time when the Illinois and Michigan Canal was not delivering a considerable quantity of water into it, but it was on account of the increment of flow out of the canal water, the flow there that was not flowing above.

4782 The condition of the water from Lockport down, excluding any contributions from the Illinois & Michigan Canal of the Sanitary District channel, would be substantially the same as above Lockport; that is for 7 or 8 months of the year of no significance.

I am familiar with the conditions that existed above Adams Dam prior to the destruction of that dam, and remember the embankment between the canal and the river above the dam. As I remember it that embankment was a made bank of earth, presumably more or less gravel and stone mixed in with it.

The level at the bottom of the canal was not far from the level of the crest of the dam. The crest of the dam was about 60 feet below Chicago datum and the level of the dam of the canal perhaps 58 feet below Chicago datum.

The height of the bank of the river side, with the river at low water, or at the crest of the level—of the crest of Adams Dam, which is minus 60—the level of the bank minus 50 would be ten feet.

4783 The height of the bank from the top of the towpath bank of the bed of the river would be 8 feet more. That was the rise of Adams Dam. The width of the bank on top was about 12 feet. The inside of the bank was walled, and on the outside was a slope of perhaps 2 to 1 or such a matter from there to the water, as I remember it now. The inside was quite upright, nearly vertical.



One slope was built up in the nature of a dry wall, and the other was protected in the nature of rip-rap. I did not notice whether the waters had had any effect upon that bank. I do not remember now of any influence of the action of the waters of the Desplaines river on that bank. That bank extended half a mile or more, something like that as between the immediate river and the canal.

4784 As to the portion of the river where the Economy Light & Power Company Dam was under construction involved in this suit, I am familiar with the location where that dam was under construction. I am familiar with the character of the towpath bank there.

Q. What is the character of that bank as compared with the bank above Adams Dam?

To which question counsel for complainant objected, as incompetent and immaterial.

A. It was similar, a made bank. The material appears to be a stiff clay. As to how the material compares with the material of the strip above Adams Dam,—I cannot state specifically for the character of the interior of the embankment at Adams Dam, as I can down near the mouth of the Desplaines river, because I saw more or less of the material of which it was constructed at later places, that is, material on the interior of the bank.

Concerning the quality of the material of the towpath bank at Dresden Heights as to its durability or resistance to 4785 the effect of water,—it was quite radically suitable for the purpose of building an embankment.

I have seen prints showing the same thing that is on these two sheets marked Sheet 1 of plans of dams May 20, 1908; the first is a blue print and is marked G 1527, and G 1553 is the other. Whether they are exact copies or not I cannot state.

Assuming the formation of a pool by the work contemplated in these blue prints, that pool, if resting upon the towpath bank at Dresden Heights, would not effect the durability of that bank any further than what might be occasioned by the wave action. The effect of wave action could be prevented by riprapping the surface of the bank exposed to the wave action. There would be no necessity of riprapping the 4786 top of the bank or paving it, so far as wave action was concerned. I noticed about two months ago some riprapping or filing of stone on the beach, on the inside of the



canal. None of the navigable waters of the canal were encroached upon by that riprapping.

Q. Assuming if the dam is built in accordance with the blue prints which you have examined, state whether or not the pool level—state whether or not provision has been made to control the pool level, and the pool to be created by that structure.

Counsel for the complainant objected on the ground that the question calls for information that lies outside of the blue prints the witness is looking at,—which objection was overruled by the court.

4787 A. The plans show that such provision has been made.

4788 I should say that the provision as shown on these plans would have a level two feet below the top of the towpath, as proposed and shown on these plans—and that would be ample to take care of two or three times what the maximum flow of the stream might be at that point.

I have examined and know the location of the Kankakee feeder. It would be entirely feasible in case that feeder was restored to use, to convey the waters from the feeder to the canal without rebuilding the aqueduct.

Assuming that the pool has been created, according to the best engineering practice, the method that would be used for so conveying the water, would be by using what is termed sometimes a syphon or a pipe laid on the surface of the ground or immediately below it to and underneath the waters of the river. That pool would be a feasible and practicable thing.

Assuming that it was desired to restore, or to have navigation upon the feeder, it would be possible, with the existence of this pool, to arrange so that boats could pass from the feeder to the canal into it, in this way.

The boats might be locked in the canal on one side, locked in the pool on one side and locked out on the other and vice versa.

I have examined the columns on which that aqueduct formerly rested. It would be impossible to use those columns in their present condition, in case it was desired to restore the aqueduct, because they are in an uncertain stage of stability, and one or two of them leaning more or less. They show the defects of age in a way that makes it quite conclusive that they should not be used at all.

It is a rule in rivers that the depth varies from point to point, and that formations known as pools and shoals will be met as the length of the river is traversed from one end to the other, growing out of the fact that its bed is not absolutely homogeneous in resisting the erosion of water, and where the softer spots are, the water gets deeper than 4790 where the hard spots are. That condition of shallows and pools will exist in all creeks having sharp declivities.

*Cross-Examination.*

I am not in the employ of the defendant company. I am employed to make certain investigations and to be a witness here. I was first in the employ of the defendant company in June of 1898. I was with them until about the first of August, in 1898, and then again from the first of December, 1898, to the first of January, 1901, and then from January to December 1902. That is correct I think perhaps within the error of a month.

I have had no employment subsequent to that time that could be measured in terms of time. They have asked me at one time or another to make some investigations or to do some service in the nature of consulting work, perhaps 4791 taking two or three days at a time at one time or another. That has occurred perhaps once in six months, may be a little oftener. My last employment at their hands was in the last year. That character of employment has lasted up until the present time.

4792 Q. You have given us your experience as a civil engineer at considerable length. I want to ask you about some other phases of it. When was the last lawsuit in which you testified as an expert?

To which question defendant by its counsel objected on the ground that it was wholly immaterial; which objection was overruled by the court.

A. In the present week. That was at Madison, Wisconsin. The last one prior to that in which I testified as an expert, was about a month ago, at the City of Chicago. The one last before that was in February of the present year, at the City of Chicago.

4793 Next prior to that I so testified as an expert, as near as I can remember now, in February a year ago at Joliet, Illinois. Next prior to that I testified as an expert,

as I remember now, in January of 1907 in the City of Chicago. I don't recall now any other suit in 1907 in which I testified as an expert. Oh, I beg pardon, in 1908 I testified before the Legislative Committee in the City of Chicago early in January. My recollection is that it was early in January that I was called. It was about the first of January of the present year. I did not go there and give testimony in that case at the instance of and on behalf of this defendant, I did not testify in their behalf in January, 1908, nor in December, 1907. I did not go before the Legislative Committee, either in December, 1907, or January, 1908, and give testimony at the request of the Economy Light & Power Company or some one in its behalf. I was summoned there on a subpoenae signed by Mr. Shurtleff, I understand at the instance of the Illinois and Michigan Canal Commissioners. I cannot state of my personal knowledge whether it was so or not.

I was not paid for my attendance and service there, and was not promised pay, and do not expect to get any pay. In the case in March, 1907, that I testified in, that was on behalf of the Economy Light & Power Company. In January, 1907, I testified as an expert on behalf of the City of Chicago.

In the examination before the Legislative Committee the subject matter of the inquiry there was about this same dam that is the subject of controversy here. I have given you all the occasions in which I have testified as an expert during the years 1907 and 1908, as near as I can recollect now. I do not recollect any other occasions now during those two years in which I have testified as an expert witness.

I testified in a case pending against the Sanitary District of Chicago during the year 1907,—which I believe I referred to—it was a case pending between the—as I remember it between the Economy Light & Power Company and the Sanitary District of Chicago with reference to a water power proposition known as the Gaylor proposition at Joliet.

It is not my recollection that within the last couple of years or thereabouts and within a few months of each other I testified in one case for the Sanitary District of Chicago and another against it.

I first entered the employment of the Sanitary District of Chicago the first day of April, 1890. I entered their employment at the request of Lyman E. Cooley. Mr. Cooley

was the chief engineer of that district at that time. My employment under him was as an under officer or employe. I continued at that time in the employ of the Sanitary District of Chicago until the 10th day of December, 1890,—from the first of April until the 10th day of December.

After that time I quite the employment of the Sanitary District. I resumed it again on or about the 20th of January, 1892. I remained in the employ of the Sanitary District of Chicago at that time until the first day of July, 1900, or eight years and a half nearly. Then I left their employment, and did not resume it again. I have not been in the employ of the Sanitary District of Chicago since the year 1900.

As hydraulic engineer, I am at the present time doing some work for the City of Chicago. I have pending water power matters at Rainy river in Minnesota.

4798 Between 1892 and 1902, these two corporations did not have litigation in court, to my knowledge. It might have been between the state and the Sanitary District. I did not understand that Economy Light & Power Company was a party to the litigation at all.

The central thought was with regard to alterations to be made in Dam No. 1 of the Economy Light & Power Company at Joliet. I did not understand that that was owned by the Economy Light & Power Company. I understand that the waters that would flow past that dam were leased to the Economy Light & Power Company; that the Economy Light & Power Company had anything to do with the dam either by lease or property right I never understood. I understand that the Economy Light & Power Company had the power created by the dam but did not have the dam itself.

4799 I never understood that the matters in which I testified were matters involved between the leasehold interests of the power company on the one hand, and the Sanitary District of Chicago on the other. I understand that I testified in behalf of the Sanitary District in the litigation pending between the Sanitary District and the State of Illinois, in which indirectly the Economy Light & Power Company was a party in interest, and at that same time I was not in the employ of the Economy Light & Power Company, having withdrawn from their service. I had a vacation in their employment from the inception of that litigation until its termination, which was about four months. I did  
4800 resume employment with the Economy Light & Power

Company after the litigation was over or after the consent decree of the court was given out. And during that interval of three or four months in my employment by the Economy Light & Power Company I was in the employ of the Sanitary District of Chicago.

I have appeared upon the witness stand, as an expert witness in various cases in the last five or six years, approximately three or four times a year. Five times, that is all. This is the fifth time during the present year, including the appearance before the Legislative Committee.

I do not know of a company known as the Brushingham Syndicate or Company, or the name of anything which is pretty close to that, nor does that suggest any company that had me in their employ at any time.

4801 I think I have a suggestion now dating back as far as 1894, when after having asked the Chief Engineer of the Sanitary District for permission to do so, and it being granted, I was employed by Clarence Buckingham. That occurred about 1894, as I remember. It wasn't 1898. I prepared plans for a water power scheme for them between Lockport and Joliet, which, if they had constructed would have used the waters of the Sanitary District of Chicago. While I was doing that I was also in the employ of the Sanitary District of Chicago.

On two occasions I have been employed by contractors, who brought suit against the Sanitary District of Chicago, and appeared as a witness in their behalf in court. One 4802 was a suit brought by Alfred Hartlive for damages on account of the forfeiture of a contract. Another was a suit brought by a Mr. Sexton being of the same nature.

In June, 1886, I was first employed in the City of Chicago. Not to live here; my business prior to that time was not here.

All the information that I have concerning any of the matters about which I have testified, my personal knowledge of them only extended back to 1886, and such matters as I have testified to prior to that time was information gathered from such sources from which an engineer usually gets his information.

I surveyed the bar that is in the Desplaines river 4803 a short distance below the Riverside gauge, in 1893. I have been at the site of those bars numerous times at various seasons of the year. In fact I have been in that

vicinity quite frequently. I have made it a point to examine the bars. I examined them in the sense of a survey, that is with an engineering object in view. I did that in 1893 and again in the summer of 1894, and at odd times since then. I remember it distinctly, but not always as to the point of time, because I have been there so many times that I naturally would not charge my mind with any particular time.

One of the sources of losses to the river that I have  
4804 already mentioned is the cutting of the divide at Kedzie avenue in 1852. I know of that by such information as engineers usually use in such connection. I have  
4805 seen it in literature generally, and engineering literature pertaining to the time. Mr. Cooley prepared some of it. I don't know who prepared the greater part of it.

I cannot tell specifically without calculation how much water the Desplaines river lost by this cut I have mentioned. I won't say that I do not know, but I will say that I have not made calculations and cannot state at this time what the  
4806 loss would be. In a certain sense, it is true that at this time I don't know. In this sense it is not true, namely, in that I have knowledge that there were losses. How much the loss is I am unable to state now, as I do not know. By virtue of the elimination of what is known as the 12 mile level, the Desplaines river lost some water naturally. I might add that I mean the elimination in regard to its width. Elimination means to rub out or take out. I mean by the elimination of what is known as the 12 mile level the restriction of its confines to a very narrow region. I cannot state how much water the river lost because of that.

4807 The segregation of the drainage basin southward from the Illinois and Michigan Canal by the construction of that canal also caused the Desplaines river to lose some of its natural waters. I mean that the building of the Illinois and Michigan Canal on one side of the river cut out the flowage into the river from that side. I cannot state at this time how much water the Desplaines river lost by that. To the extent that the Illinois and Michigan Canal was fed from the Desplaines river in early times there would be some loss to the Desplaines river.

4808 I cannot state how much water was lost to the river by that process; I do not know that. As to what other thing existed or came into being that caused a loss of water to the Desplaines river,—the Illinois and Michigan Canal at

Joliet, that is the feeding of the canal in Joliet, we will call that. I cannot state at this time how much water the river lost on that account. At this time I can think of no other thing or factor which existed whereby the river lost water that naturally flowed into it. I have mentioned the drainage of Mud Lake into the Chicago river instead of permitting it to flow into the Desplaines river. The cut made in 1852 at Kedzie avenue includes that.

I recall right now another construction that would 4809 have the same effect, and that was the same construction of the Ogden and Nickerson Ditches. There were two of them. I don't know the amount of water lost by any of them,—not to my personal knowledge.

I believe I have examined, for this dam that the defendant is proposing to put in the Desplaines river, as far as drawings are concerned, on two occasions only. I examined them on the ground once. I have not examined the specifications. There was handed to me here a few minutes ago two sheets of the plans of this dam, and I looked at them for perhaps a minute, each of them, or half a minute, each of them. I did make calculations to enable me to make the answers that were put to me from that examination.

4810 I was asked, as I remember it in that connection, whether this dam that was there being constructed as shown by these plans was capable of taking care of the flood waters that might come upon it; and I looked at the plan and within 30 seconds of the time I was asked the question I answered it. I arrived at my conclusion in this way,—  
4811 I constructed a dam across Snake river in Idaho, having a spillway substantially the same as this crest of this dam. I had made calculations of that dam in Idaho and was familiar with it and was able to calculate at once what would be the spillway of the work at Dresden Heights. The amount of water I took as entering into that calculation that might come down this Desplaines river was about 25,000 cubic feet a second. There is the spillway and the tainter gates and water wheels, and some sluice gates, I believe. I don't remember without looking how many tainter gates there were; I think there were some sluice gates,—I am not sure without looking at the map. I remember there was a spillway about 400 feet long.

4812 Its length is as essential an element as any other element in the quantity of water that it will carry. Another element is the head in which the water will discharge



over the dam. An opening of a certain width through which the water goes is what I described as being the length of the spillway.

I do not recollect without looking at the plans how many wheels are provided for in this dam.

Q. And you feel that you have sufficient data in your mind from the casual examination or short examination made to-day, to enable you to make these calculations, and you did make them?

A. Yes, sir, to make such calculations as I have evolved in my answer. I have examined them at one time before. In making my calculations to-day I remembered and took into account the examination made before, to some extent; together with what I have seen in connection with works which I have constructed, on the Snake river, and what I have seen on these drawings.

4814 I won't say I saw numerous other plans, perhaps two or three sheets of drawings as I remember it now. That was two years ago possibly. I am not the consulting engineer for the Economy Light & Power Company. Had no connection with this dam down here; I did not state that I had been consulting engineer in that capacity, in connection with this work. It was in connection with the work at Jackson street in Joliet. 25,000 cubic feet of water per second is the largest amount of water that may be expected down that Desplaines river at the site of this dam.

I have taken in the ultimate capacity of the Sanitary District Canal at 10,000 cubic feet per second. The Sanitary

District Canal has not a capacity for a good deal more  
4815 than that, throughout its whole length and the low level of Lake Michigan.

There is a little portion of the canal that has not yet been built, as originally contemplated, as I understand it. The canal as contemplated at any time during my connection with the work, is completed now excepting the portion eastward from Summit. The plan did not contemplate when completed a capacity of 14,000 cubic feet instead of ten throughout its entire length. I did not understand it so.

It was given originally and during the time I was connected with the service of the Sanitary District a capacity of 10,000 cubic feet per second throughout its entire length. Lately a project of tapping a canal through the Calumet or Sag  
4816 from Lake Calumet to the Drainage Canal has been spoken of, which under certain circumstances might re-

sult in 14,000 cubic feet per second being carried to Lockport and less than 10,000 feet from Chicago.

I have been at the site of this dam that is being built by defendant, in recent years once. I was in the employ of the Sanitary District of Chicago and in the first instance Mr. Cooley was my superior officer. I left the service at the same time that Mr. Cooley did. I went back again, after Mr.

Cooley did and became a subordinate with Benezette 4817, Williams as chief engineer. I acted as chief engineer on several occasions. I was never known on the record as chief engineer. Besides Mr. Cooley and Benezette Williams, Isham Randolph was my chief officer.

I acted as chief engineer in the month of December, 1893, and in the month of April, 1900, that I recall now. On other occasions for perhaps a period of two or three days or a week in the absence of the chief engineer. It was on occasions when he was called away. My work in most all the work I have done has not been office work in contraven- 4818 tion of field work; in fact rather the reverse.

Q. While you were in the office with Mr. Cooley you did not do anything outside except when he divided his force on one occasion to make surveys in three different places, you were assigned to one of them and had one of them?

A. No, sir, that is not the truth.

Q. That is not true?

A. No, sir, it is not.

Q. That is all.

*Re-direct Examination.*

I was engineer for the Economy Light & Power Company excepting for a period of two or three weeks I was employed by the Sanitary District as consulting engineer. I had a general practice aside from that. When I testified in the case of the Sanitary District against the State, in 1898 I testified for the Sanitary District.

4819 I stated I had testified possibly four or five or three or four times a year during the last five years. None of it was for the Sanitary District. The fact that I was preparing plans for Buckingham in 1894 was known to the officers of the Sanitary District. It was known to the chief engineer, Isham Randolph. Mr. Buckingham consulted him before he spoke to me, and Mr. Randolph called me in and told

me the circumstances and left me at liberty to accept the employment.

In February of this year I testified in behalf of the City of Lake Forest, Illinois, in a controversy relating to a fair, just and reasonable water rate. About a month ago I testified in Judge McEwen's court, in this building, on behalf of the Crane Company in a suit or personal damages.

That suit in which I testified last year for the Economy Light & Power Company was a condemnation proceeding,—that is my recollection.

4820 The last time that I can remember that I was consulted by the Economy Light & Power Company at all with reference to its affairs outside of my preparations for the trial of this case,—as I recollect it that was last August.

Q. This Calumet proposition by which 14,000 cubic feet of water per second is contemplated, has not been adopted, has it?

A. I do not understand that it is.

Q. Do you know what the attitude of the War Department is as to that project.

A. I think I do, yes, sir.

Q. It has not been supported, has it, or it has not been approved?

COUNSEL FOR COMPLAINANT. To that I object.

COUNSEL FOR DEFENDANT. That is a matter of common knowledge.

The COURT. Sustained.

GEORGE H. MUNROE, for complainant, testified as follows:

*Direct Examination.*

My name is George H. Munroe; residence Joliet; my  
4940 business is mortgage loans and real estate in the summer season. In the winter it is raising oranges. I have lived in Joliet since the fall of 1862. I was eighteen at that time. I was in Will County before 1862. I was taken as a little boy fourteen miles south of Joliet on a farm. My father moved there in, I think it was the spring of '50, about '51, the fall of '51, perhaps. I only recollect once seeing the Desplaines river until I moved to Joliet. That was in the early summer of either 1853 or 1854. I saw it at the ford

near Channahon, crossing the Desplaines river; no bridge, but a ford. My grandfather and uncle started for California at that time with ox-teams and father and I accompanied them down to the bank of the river. We nearly 4941 tipped over, the oxen running the wagon up on to some large hard-heads, sometimes called nigger-heads. I was very much frightened, and my recollection stayed with me a long time. Not a large amount of water; the water perhaps at that point in the ford might have been two feet deep in places, not all, and a great many hard-heads or nigger-heads in the channel. I moved to Joliet in 1862; I have seen the river, not every day, but a great many times since 1862, particularly since the spring of 1863. I had occasion to see the river a great many times. For two years I was travelling about the county as deputy sheriff for that time. I commenced going into the country in 1863, the summer of 1863, and 1864, and the winter as well. I did most of the outside work of the office, errand boy. I had occasion to see it frequently during those years. The parts of the river 4942 that I became familiar with were from Channahon up to Romeo, north of Lockport. The condition of the river above Lockport in the days before the deep cut was made in 1871, was that the greater part of the year there was not very much water in the channel. There were holes, wallows perhaps; a good deal of stone and nigger-heads in many places. One could at dry times almost go across it with shoes on with a little care; easily with the old fashioned leather boots. By the expression "very little water during the greater part of the year" I mean very little water running in the stream. Expressing that in the quantity of water, I don't believe there were six inches of water on the level, some holes deeper. Below Joliet prior to 1871, I have often crossed the stream at different places, and many times 4943 wading in the stream, fishing. My knowledge of the stream in those days went as far as the ford at Channahon, but more especially from below Joliet, below what is known as Malcolm's Dam, and then at Treat's Island.

The condition of the river before 1871 from Joliet down to Channahon was that the channel along the rapids some ways below Joliet, perhaps for half a mile down to near Brandon's bridge, there was pretty shallow places around Treat's Island, not enough water to pole a row boat up-stream. You might float one down perhaps, carefully, have to step out once in a while. That condition would remain a good many

months of the year. The seasons, of course, varied. Sometimes there would be a wet season when we would have a great deal of water, but there was times in the winter months that the water was as low as in the summer. In the ordinary season, after the subsidence of the spring floods, from that time up to say November first of that year, the water was very low, barring sometimes we would have summer  
4944 floods and they would not last long, a few days. By

the expression "very low" I mean about a stage that one could not push a row boat up-stream, there was not water enough. I recollect the nigger-heads and boulders south of which was about eighty rods from what is known as Jefferson street. There was a dam at Jefferson street, and Malcolm's dam, was about eighty rods below. It was latterly known at the time it was taken away as Adam's dam. In the stream from that point down, in that part of the stream with which I am familiar, there was a great many boulders; that is, from Adam's or Malcolm's dam south for some distance, a long distance, and the fall is quite rapid. I don't think I ever ran over what you call the rapids. I have had a skiff below the dam, but too much work to get it back. I have been  
below the Malcolm's dam in a skiff.

4945 I am interested in the lakes to the gulf proposition, for educational purposes for a waterway. The first convention of the association was lakes to the gulf, held at St. Louis, two years ago this fall; about twelve hundred delegates gathered there and organized this association. The next meeting was held at Memphis and the next one will be held in the City of Chicago in October, 1908. I am treasurer of that association. The purpose of that association is a deep waterway from the lakes to the gulf, and the special work of the association is to agitate and educate the people along the line. I know what is proposed to be done by the

Economy Light & Power Company near the mouth of  
4946 the river in a general way. I made investigations, for the purpose of ascertaining whether the building of this dam and the work would be an obstruction to that project.

I wanted to know what their plans were, whether it was going to interfere with our waterway, their dam there,  
4947 and from their plans and statements made—I saw the plans.

I have been in the river in a row boat since I first became acquainted with it.

Q. State whether or not the Desplaines river in the days prior to 1871 was capable of being used by boats for purposes of commerce.

COUNSEL FOR COMPLAINANT. We object to that, without qualification.

The COURT. He may answer that.

A. I don't think it possibly could be used for navigation; not enough water, too much falls, too many rocks.

COUNSEL FOR DEFENDANT. State whether or not, in your opinion, the Desplaines river, at the present time is capable of being navigated for the purpose of commerce.

COUNSEL FOR COMPLAINANT. Objected to for the same reasons.

The COURT. He may answer.

The WITNESS. I don't think so.

At the present time, there is plenty of water, but the current is so swift, and the rocks, boulders laying there, I do not believe it is safe to try to navigate it there. I never knew at any time in my life, of any navigation being carried on in this river. I never knew of a boat used for commercial purposes upon the river at any point. I never heard of any such boat, or any such navigation.

4949 I am no relation of Charles A. Munroe that I know of. I have no relation whatever to the Economy Light & Power Co.

I have been in the mortgage loan business perhaps fifteen years or twenty years. Prior to being in the mortgage loan business, I was brought up on a farm, and after coming on to Joliet was deputy sheriff for two years. In 1865 I entered the grocery business, retail grocery business, and I was 4950 in that for ten or twelve years, and went into the wholesale grocery business and for many years have been interested in the stone business. I am vice-president of the Western Stone Company at the present time, but do not give much time to it. My grocery business ran up to the time when I began to devote my time to the real estate and mortgage loan business. We buy and sell a good deal of real estate. At the time I left the wholesale grocery business I began giving my time to the real estate mortgage and loan business.

I was at Springfield as representing our district in the State Senate. I have given all of the different form of business which have been my occupation my time and attention

and which have been my occupation and they have taken  
4951 the bulk of my time. In the winter I am looking after  
an orange grove, at which I spend about five or six  
months.

I think the Illinois and Michigan Canal was opened and  
in use when I first struck Will County, and has been ever  
since. I have not visited the proposed Economy Light &  
Power Company dam since they have commenced to work. I  
have visited the location several times before. I visited at  
Springfield during the session of the Legislature last spring.  
I used my influence and considerable time against the claim  
of the Sanitary Drainage District to build a sluiceway through  
Joliet. I did not meddle with the bill to remove obstructions  
from the Desplaines river very much one way or the other.

It was the Sanitary bill that appeared to be dangerous  
4952 to me. I am in favor of the waterway and not so par-  
ticular about the water power.

5063 WILLIAM P. GRAY, a witness for defendant, testi-  
fied as follows:

*Direct Examination.*

My name is William P. Gray; age 63 next month. I re-  
side at Pasco, Washington. My life business has been swift  
water steamboating. My last work was on Snake river. I  
began swift water boating when I was 15 years old on the  
Fraser river in British Columbia, swift water. I was operat-  
ing batteaus, with my father, above where steamboat naviga-  
tion ends. In the winter of 1860-1861, father and I built a sail-  
boat 91 feet long and 12 feet wide at the head of the Okana-  
gan river, took her down the Okanagan and Columbia  
5064 river to the Celilo Falls. In the fall of 1861 I commenced  
operating on Snake river, helping, assisting my father,  
I was what they call the Batteau man. I went in a small boat  
and carried the lines up ahead so as to make them fast to  
rocks and stumps and then we would carry the line down and  
the large boat would catch hold of them and warp us. In  
that way I went over the river about three times every trip  
we made up. In 1862 I was running a sail boat, I was captain  
of a sail boat on the Columbia river from Celilo Falls to  
Wallula, Washington. In 1863 I went steamboating with my  
father, running from Celilo up the Columbia to the Snake;



up Snake river to Lewiston; up the Clear Water river to Lapwai. Pasco is at the junction of the Snake with the Columbia river. In '64 I was steamboating on the Columbia and Willamette, between Portland and Astoria as mate. In

'65 I went as master and pilot of steamers for the 5065 Oregon Steam Navigation Company between Celilo and points on the Columbia river and tributaries as far as Lewiston on the Snake river and Priest Rapids on the Columbia. I continued in that business for two or three years. In '67 I was employed by the United States Engineers as assistant engineer and captain of a steamer to survey the rapids of the Columbia river between Celilo and the mouth of Snake river, doing all the soundings with a small boat myself, sounding all rapids ahead—in swift water it is very difficult to get soundings. We have to put a line away out ahead and swing the small boat on it. It is very dangerous where the water is swift and rapid and in amongst rock. I could not trust anybody else, so I had to go myself, between Celilo and the mouth of the Snake river. In '69 I was employed as master and pilot of passenger steamers by the Oregon Steam Navigation Company. In '70, '71 and '72 I was master and pilot and part owner of tug boats on the Columbia river bar, and tributary streams around Astoria. In '73 and '74 I was in the butcher business. In '75 I went on the Willamette river running from Portland through the locks up as far as Harrisburg, which is the extreme 5066 limit of navigation, and also navigated the Yamhill river as far as McMinville river, which is only navigable about two months in the year, a small stream. In '77 I was employed to take a steamer from Seattle, Washington, to Fort Wrangel, Alaska; then run her on the Stikine river, which runs—which empties into the bay eight miles above Wrangel, extending back into British Columbia. That is considered one of the most difficult and dangerous to navigate on the Northwestern coast. I was master and pilot; did not have any pilot with me, done my own piloting. The man that went up next year sunk her the first trip, but that was none of my business. In '79 I went back to work for—hold on, I am ahead—I went back to work for the winter on the Willamette and Yamhill, and in '78 was sent for back again onto the upper Columbia river to run steamboats up there as master and pilot. I don't know of anything to say about the Gov-

ernment boats. In '78 I was selected to run a patrol  
5067 boat on the river carrying troops. During the Bannock  
Indian War I patrolled the river and kept the Indians  
from crossing, and made it possible for the troops to over-  
take them and capture all the Indians and ended the war. In  
'79 and '80, the same thing. In '80 was selected by the gen-  
eral manager of the Northern Pacific Railroad to go to Aims-  
worth and take charge of their transfer boats across the  
Snake river while they were building a bridge across the  
Snake river for their railroad. I was there until 1884. Dur-  
ing '84 the president of the Oregon Railway & Navigation  
Company requested me to make a reconnaissance of the river  
of the Columbia river above Pasco, which had been declared  
impassable, the rapids had been declared impassable, and he  
wanted me to make a reconnaissance, and I did so and reported  
that it was possible to take steamboats up over the rapids in  
medium and high stage of water. My report was given to  
the United States Engineers and is embodied in the report of  
Engineers of the United States Army for 1884, and I worked  
for the Northern Pacific Railroad Company almost continu-  
ously until '94. In '95 I brought the steamer Norma from  
Huntington, Oregon, down through the Snake river canyon  
250 miles to Lewiston, Idaho, where I had never seen the  
river before, and arrived safely. In '96 I was operat-  
5068 ing at the Cascades of the Columbia in swift water for  
the contractors handling their scows and towboats.

The contractors were building locks for the Government  
around the cascades of the Columbia a canal and locks. In  
'97 I was master and pilot on the Columbia river between  
Astoria and Portland. In '98 I drew plans and superintended  
the construction of two steamboats with the Klondike Mining  
Trade Transportation Company of London, England. I built  
the boats and put one of them—started up to Fort Wrangel  
with one of them and had a pilot that ran me out onto a rock,  
busted it, wrecked it, but was sent on to another boat up there  
and ran her that season for 27 trips on the Stikine river  
without an accident. In '99 I fitted out a stern boat at Seat-  
tle, Washington, took her up across the North Pacific Ocean  
and Behring Sea to St. Michaels, took a load on at St. Mich-  
aels and continued on up to Dawson on the Yukon. There I  
met a captain who wanted to stay in all winter and I wanted  
to go on out, and I took his steamer and ran her up 480  
5069 miles to White Horse, which is the head of navigation on  
the Upper Yukon; had no pilot on it, never had seen the

river before. The only place I had a pilot on the whole trip was St. Michaels to White Horse, a distance of about 2,200 miles, was 90 miles over the Yukon flat. I returned to the Yukon during 1900 and 1901, was carried out on a stretcher that fall and refused to go in.

In 1902 I was engaged by the Northern Pacific to run a steamboat on Lake Couer de Alene, and the St. Joe river and ran there until 1904. Then the Northern Pacific sent me over to Lewiston, Idaho, to run a steamboat in swift water where the other boys thought it was a little dangerous.

Q. Was that above or below Lewiston?

A. Above Lewiston, up through what they call the Wild Goose Rapids, and I ran there for about a year, and in 1905 I made a trip down over the Snake river and the Columbia from Lewiston, Idaho, to Celilo to the opening and dedication of the Oregon-Portage Railroad. In 1906 I was running on Snake river, carrying supplies and equipments to the contractors for construction of the Spokane, Portland and 5070 Seattle Railroad. From 1884 to 1890 I was captain and pilot. Out there we do not carry any pilot. The captain is the first pilot, he is supposed to—from '84 to '90 I was in the employ of the Northern Pacific in charge of their transfer across the Columbia river at Pasco during that period, six years. The bridge was completed—well, in '88 a company of people from Ellensburg,—a captain from the Mississippi river induced a company to build a steamboat to run from Pasco up the Columbia river through the Priest Rapids, Rock Island Rapids, and other dangerous rapids to the Okanagan country, where there were mining interests. Just before the boat was completed the captain went up and made a reconnaissance of the river, got cold feet and left the country. The company came to me and said that they built that boat on the strength of my report and asked me to take her. I had a lucrative business then in the real estate business. I neglected that and went up there and took that boat up and there—I got ahead of my time now again. In '87 the 5071 O. R. & N. Co., Oregon Railway & Navigation Company, the manager and officers, with General Gibbons, who was the Department Commander of the United States Army in Washington, with 120 soldiers went on a steamboat and tried to get her through—take her through the Rock Island Rapids. They got right into the Rock Island Rapids. They are on the Columbia just below Wenatchee. They failed to get through. Their captain failed them and I took it and took

her up through the rapids 220 miles up the Columbia river onto the Okanagan river and made several trips. You will find the Okanagan coming right down from the mouth. I took the boat up there and made a success, and they are now running boats up there above these rapids regularly. It is dangerous to take a boat over there, in fact, there was one wrecked coming down last year, but I never had any trouble.

I think that I am competent to pass an opinion on the  
5072 navigability of swift and shoal waters. I have seen the Desplaines river from Joliet to its junction with the Kankakee. I have been in Chicago before, in the fall of '92, in the fall of '92, from July to the 27th of December, '92. I was in the real estate business. I never saw the Desplaines river at that time. I was a commissioner from the State of Washington to the World's Fair. The first time I saw the Desplaines that I remember was yesterday. I saw it from a point at Joliet and the Kankakee, where they join the Illinois, make the Illinois.

Q. Will you state whether or not, in your opinion, the Desplaines river between the two points that you have  
5073 named, Joliet and the mouth, is navigable river, capable of being navigated for useful purposes of commerce?

Objected to as irrelevant, incompetent and immaterial.  
Overruled.

A. It is not.

COUNSEL FOR DEFENDANT. Why not?

COUNSEL FOR COMPLAINANT. I suppose, your Honor, we may assume that that objection will stand to all subsequent questions without reception.

The COURT. Yes.

A. In the first place, commerce could not be handled, freight could not be handled on the river in competition with wagons alongside, as the current in the river, shoals, rocks and bars, would preclude the possibility of carrying freight enough on boats to make it commercially successful.

In my opinion, it would not be possible with safety to take boats engaged in carrying freight up or down the Desplaines river, because there are quite a number of boulders in the river.

As I have seen the river, of course, there may be some flow in it, but as I see it now there is not depth of water enough to allow boats to pass over with safety. The form of  
5074 construction of light drafts boats is such that their bottom is very weak on account of having to be buoyant.

A small obstruction in the river coming in contact with the bottom would break a hole. That, of course, would be expensive to repair. A slight hole of six inches in diameter in the bottom of a boat would cause her to sink. The expense of—there might be such a thing as a skiff or something of that kind being taken down, but commercially I should say that it is not practicable at all to navigate the river. There are quite a number of boulders in the river. I determine that fact by my knowledge of water.

Q. At the mouth of the river where the dam is being  
5075 constructed, assume that at those points in its natural condition the river had in its bed a very large number of boulders, some above the water, others below it, and that in its natural condition the river did not have to exceed 15 inches of water at any time during the season except in periods of freshet; what would you say as to the navigability of the river in that condition for useful purposes of commerce?

Objected to on the same grounds, and also on the grounds that the hypothetical case put does not conform to the evidence, and also on the grounds that it singles out four spots and omits the rest of the river. Overruled.

5076 I would say it would be less expensive to build a steam-boat railway around the outside and let the river bed  
5077 alone. It could not be navigated.

Q. You have stated that you took soundings in 1867 and 1868 under the survey made by Colonel R. S. Williamson, Department of the United States Engineers. Were yours the soundings that were reported as the soundings of the rapids and river?

A. No, sir, I was just—they were reported by Lieutenant Heuer.

Q. Are those the soundings? I call your attention to the volume, part five of the annual report of the United States Engineers, United States Army for 1891, on page 3214, thereof, schedule of Snake river, showing slopes per mile, and ask you whether the slopes are at low or at high water, or at what stage of the river as given in that report?

COUNSEL FOR COMPLAINANT. I object if the court please. The report speaks for itself.

A. I cannot say positively that I know.

COUNSEL FOR DEFENDANT. Q. Pick out any of those and see what is stated there and then possibly that will refresh

your mind. This is the column of slopes per mile and there are different rapids?

5078 A. I recognize all those rapids, but we pay no attention to figures in steamboating. The slope per mile carries no meaning to a river pilot. He goes and he takes his boat over, judging the depth of water by observation, what he can go over satisfactorily, what he cannot is—

Being asked what the depth of water has to do with the navigability of a river at places where the slopes are high, will say the deeper the water the better you can navigate it, and in most of the places where the slopes are the highest the water is narrow and deep. That is true in places on the Snake river.

Being asked to give the character of the Snake river if I can, as to its width and depth, the part of it which is navigated, will say that on the shoals between Lewiston and Ripara where navigation is being carried on at all times, the river is, I should estimate, say between 700 and 800 feet wide. The shoals are—on the shoals it is wider, but the water is distributed over those shoals in such a way that with a boat drawing  $2\frac{1}{2}$  feet of water it would require four feet depth to proceed without touching the bottom, as at the break of shoal she will tip up the weight of her,—of course where there is a break the weight of her that goes out of water will bury the center. The stern wheel

which is digging out the water from the bottom  
5079 is digging away her support. Those two actions cause the center of the boat to drop and go down further and her natural draught when all of her whole bottom is in the water, consequently we expect to touch,—with a boat drawing three feet we expect to touch center on three feet six inches or four feet. In gravel you have got a great deal more surface to strike your bottom than you have—gravel or sand—than you have where it is rocks. If you have rocks or boulders they are isolated points and the boat will go with more speed. She won't have so much underpinning, as you might say. She strikes those rocks and they knock holes in the bottom. On gravel the blow being distributed all over don't make so much damage.

Q. Is it then true to say that in swift water if you have a gravel or a sand shoal you can go very much safer and more rapidly than you can if there are boulders?

A. Much more so.

Objected to. Overruled.



COUNSEL FOR DEFENDANT. Do you know the depth at low water at Little Pine Tree Rapids, on the Snake river?  
5080 A. In extreme low water there is about two feet, that is at Little Pine Tree Shoals. Little Pine Tree Rapids are from six to eight feet of water in the channel. The river begins to rise in the spring about the first of April. It does not recede so as to interfere with navigation until about the first of August. From the first to the middle of August is generally the lowest water we have, and then it is low from the middle of August for about two months, or very close to the first of November. Then we have the fall raise. The high water in the spring is all caused by melting snows in the mountains. The fall raise is caused by rains which fall in the winter time, before they are frozen and turned  
5081 into snow. These rises in the spring, this high water rises to a height of sixteen to twenty feet. It will commence at the first of April and generally about the last of May or the first of June is the extreme high water. It will gradually recede. It is a gradual rise and a gradual receding. Navigation is suspended at about eleven inches above zero, between ten and eleven inches above. That would be about—just about three feet over the bars. Aside from the bars we have all the way from eight to twenty feet of water in the river. There are spaces there where there is for miles we have from eight to twenty feet deep at low water.

Being asked if I remember what the velocity of the river is, or whether I have any accurate information as to that, will say we consider—of course, I have no accurate information,

but it is generally considered that the velocity of the  
5082 Snake river in high water is about eight miles an hour.

The effect of the raising of the water upon the slopes at these various rapids is that it equalizes the slopes so that the surface of the river is—that is, the currents are distributed—the current is distributed. That means that it flattens the slope.

5083 Q. Captain Gray, you said you were in the real estate business in Chicago for a year. Were you selling Chicago real estate?

A. No, sir, I was selling Pasco real estate. I am president of the Pasco Commercial Club.



*Cross-Examination.*

Q. I think you said, Captain, that you began work on the Fraser River in British Columbia?

A. Yes, sir.

Q. When you were thirteen years old?

5084 A. Yes, sir. That was in 1858, the fall of 1858. I was running a batteau, helping my father to run a batteau and carrying freight from Murderers' Bar, which was the upper end of the steamboat navigation to Fort Hope, and also we continued from Fort Hope to Fort Yale, through the rapids. There are a great number of rapids in the Fraser river. It is the second river in size on the coast to the Snake river—to the Columbia river. It empties into the Gulf of Georgia, which empties into the Pacific out of the Straits of Fuca just north of the 29th parallel. The total length that it is navigated from its mouth to the Canyon above Yale is about one hundred and thirty miles, may be more than that; I don't recall the exact distance, it is so many years ago. It is entirely on the Pacific slope. There is a pass at its head.

5085 The Canadian Pacific follows it down, follows down its north bank now. They came right into the pass and into the valley of the Fraser river. The old Hudson Bay route crossed the Cascade range, left the Fraser river at Fort Hope, followed the Samilkameen and crossed the Cascades across Manson Mountain, Deer Mountain, and over to the head waters of the Samilkameen, and where the Samilkameen empties into the Okonagen and the Okonagen empties into the Columbia. That is the route McDonald followed. He came through while I was at Fort Hope, I met him when I was quite a boy. McDonald was quite an elderly man at that time. He still continued to operate by batteaux above  
5086 the steamboat navigation of the Fraser. The length of batteau navigation at that time was about twenty-two miles altogether. The width of the river at that stretch was from six hundred to 1,000 feet, I should say. There were several rapids in it. The Union Bar Rapid was a gravel bar, rather shoal. In low water there was about four feet of water on it. We went on up to Emory's Bar, which was a very narrow, swift rapid, and also a very;—the channel through there was quite deep, but it was about 300 feet wide. Where  
5087 the water runs down through it was very narrow; it run through that bar in a curve and followed a cliff

around, but on the other side, on the left hand side going up was a big eddy, the current flowing around there. I don't suppose the current was over 60 or 80 feet wide and the navigation passed through that sixty or eighty feet strip there. I suppose at that one place it went about eight or nine miles an hour but it was just short, not more than a couple of hundred feet.

The next principal rapid was Hill's Bar; it was quite swift and there were large boulders or reefs that were scattered around through the river; the surface of the river from bank to bank was about 600 feet, but the channel, we had to go between rocks where it probably wasn't more than fifty or sixty feet wide. I know I was wrecked on a small boat there once.

These Pacific slope streams get their great water supply 5088 from the lofty mountains, and are quite thickly studded with boulders and erratic stones and cobbles that come down the stream. That was true of the Fraser. From Hill's Bar to the head of navigation was about three miles to Fort Yale. Then just above Fort Yale there is a fall, a canyon. The fall is right in the canyon with a little path on the outside and the boats and batteaux used to make portages to go down there. They carry around there. They sometimes would shoot the boat down stream. I never went over; I have heard them say there was about eight or ten feet fall; I couldn't say. I continued in this batteau navigation during 1859 and part of 1860. The batteaux are Hudson Bay batteaux, they are called. They are very flat on the bottom and have flaring sides, and they are sharp at both ends, with 5089 a flare; both ends are sharp. They come rather high out of the water at each end so as to avoid taking water over the freight, wetting the freight, and it is also so that the man who poles—they pole these boats and use poles, a man in the bow, they have a seat right in the middle and he guides the bow and the man in the stern holds from his end of the boat also and he guides the stern; then in poling they have a line that they attach to the end of the thwart and they cordell up that bank of the river where it is swift. I used the cordell method in going upstream every trip. When there wasn't any wind, we used to cordell about three-fourths, 5090 well, may be four-fifths of the way. And when there was a good wind behind us, we would put a sail and carry it up. I think my batteau was about 22 feet long, about 20 or 22; I would not be sure. The breadth of it was about 5 feet. I would carry from two to three thousand pounds.

The freight consisted of merchandise, supplies that would be used in the mines, beans and coffee and groceries and food of all kinds. We carried nothing on our down trip.

As to how the size of my boat compared with the other boats, or batteaux that were in use there, will say there were a great many canoes used there, the Northern canoe, the Chinook canoe was used, and also the Queen Charlotte Islands canoe was used. As to whether there were batteaux of this general type of my boat that were smaller than mine, and others that were larger, will say my father built two boats in 1858 which were small. We run them until the

winter of 1858 and 1859, then he built a boat 5091 that was fifty feet long and seven feet wide.

We used her in sailing and cordelling. She drew about a foot of water when she was light, and loaded down to about two feet and a half. She would carry about between eight and ten tons. The 22-foot batteaux would draw about two feet when loaded. The fur trade route ran off to the south of us a little. It left at Fort Hope and crossed the mountains, following a stream called the Coquilla and went across the Cascade Range. They took the Samilkameen to go down into the strait. I went across that with my father in 1860. They didn't have any boats on the Samilkameen river, that is, a larger boat than her. I helped father build a sail-boat in 1860 and 1861, when we left Fort Hope and went 5092 across the mountains down the Samilkameen river, down to the Okanogen, the head of the Okanogen. There we built a boat 12 feet wide and 91 feet long that went by sails and a sweep when we took her down the river. My father took her down there. She went down the Okanogen river, we called it 60 miles to the Columbia, then 340 miles down the Columbia to the mouth of the Des Chutes river.

Taking this map of Washington; here you will find the Okanogen up here; there is the Osoyoos Lake, and that is where we built her, right in there. Three miles from the British Columbia line. That is Lake Osoyoos; then here is the Samilkameen; it don't show that, but we came across here and struck the head waters just below the south fork of the Samilkameen and followed it 5093 right down. We followed this line that has "Preston" on it and came down here and followed over here (indicating), and stayed there all winter. We just traced the line from Preston to the lake, then we followed the Okanogen

river, and here is where we came into the Columbia at the point of its junction at a town that is called Brewster now. We followed down the Columbia river, down through all these rapids. Here is the Wenatchee river.

I point to its connection at a little town called Wenatchee. Here is Rock Island; Rock Island is right there (indicating) Rock Island Rapids.

And we came down here, here is Cabinet Rapids, a bad rapid also at a certain stage of the water. We followed down the Columbia river across the Priest Rapids, and from Priest Rapids clear down following around until we struck the Oregon line and down as far as the Des Chutes river, and right here is where we landed at that time, at the Des Chutes river.

COUNSEL FOR COMPLAINANT. Mark it.

A. It is between the "R" and "E" in the word Oregon, away down to your left.

The COURT. Down the Columbia?

5094 A. No, down here, down at the bottom of the Oregon line.

COUNSEL FOR COMPLAINANT. On the Washington map, you see the label in the white portion for Oregon of a stream named the Des Chutes coming north?

A. That is where we landed. Now in 1862 the Oregon Steam Navigation Company built a railroad from The Dallas, the City of Dallas up here to the City of Celilo, just below Des Chutes; it became the Town of Celilo.

I have just drawn a line indicating it on the Oregon side, that is where it is. As to whether coming down from the Okanogen river I struck any rapids in the Okanogen, will say there is what they call McLaughlin's Falls, McLaughlin's canon there. McLaughlin's canon creek come out of  
5095 there. Right close, just above the mouth of that canon creek there is a fall of about 6 feet, a perpendicular drop.

We shot the falls. The Okanogen at that point is about 100 feet wide. This was a 91 foot boat and there were three men besides my father. We got on down below and came to the

Colville reserve. There was no falls there; there is a  
5096 rapids there. As to how much of a rapids there is, they have taken steamboats over there in the last four years; they have taken them up. A steamboat has been taken right from the mouth of the Okanogen up into the Osoyoos Lake. As to the name of that boat, I don't know; I forget it.

Being asked if when I came down, the old Hudson Bay fort, Okanogen, was still quite a trading post, will say it was still

there but it was abandoned. The Hudson Bay Company had retired after the Ashburton treaty. Had left, yes, sir.

As to whether there was anything there, any people there, will say there was stockade there, yes; the stockade was there.

Q. Well did you encounter the Downing Rapids?

A. I don't know anything about them; I don't remember that. I remember where Lake Chelan come down. There is a rapids there.

That is the one we now call the Downing Rapids. Being  
5097 asked how much of a rapids that is will say, I suppose that is a five or six foot fall; there is a cliff on the right hand side coming down, an island below, and there is a shoal water runs over on the reef. You have to stick to the deep parts to get through. We shot that fall. That was the first time that I encountered the Rock Island Rapids. I have been through that fall since. Rock Island is a cliff that puts out on the left hand side, probably thirty feet high, perpendicular, and there is a bay above it, and  
5098 it is so that you cannot get lines around it to pull through. That Lone Rock is some distance below the rapids; it is about a mile below the rapids. The island divides the channel; it seems about equally dividing the channels. The rapids are named Rock Island from an island right in the middle; it is very abrupt and then there are high reefs of rocks running parallel with the current down below and about half way up the island there is what they call Hobbsville Point, about thirty feet high; it diverts the channel, so that you come around that point. It comes at more than a right angle the water coming around this way and you have to be very careful on those reefs below; you have to drop your boat right down close to this rock underneath so that it makes a very short bend and follow down around the island in that way. It is not possible to run, what we call, "run the rapids"; you must drop your boat down through, and in going up—  
we gauge it for dropping, by working a wheel, reversing  
5099 your stern; in coming up I had to put out four different lines. One line we had to pull her out, to work along, another breast line to hold her bow from swinging around when the current caught her, another at the stern to keep from going too fast and another at the stern to keep her from the rocks.

Q. And with all these things reversed, you could drop her down, you said?

A. No, I put out those lines going up. And in

going down I kept my boat in the clear and reversed her with the wheel, held her with the wheel. The speed of the current at that place is not over 6 miles an hour. The narrowest place is about—the shortest distance between rocks is about 80 feet, but by lengthening the current we make it more, that is, we drop the boat down and let her swing as I am holding her, and when we get ready to shoot in, we drive her into a place that way. That width is from the furthest projecting point out on one side to the further projecting point on the other. Those Rock Island Rapids occupy a reach of from one-half to three-fourths of a mile in the river.

5100 You get to the Cabinet Rapids shortly below there.

The Cabinet Rapids is an island with gravel on it, a reef on one side and gravel on the other side of the island. In high water we come up around the island and have no trouble; in low water it is like going into a box, that is why they call it the Cabinet. You go right down in and the whole force of the current goes right into that, right into a trough or into a box, so that you have to hold the boat and let the current swing her around. All the current of the river goes down and strikes the cliff and dashes up sometimes six or eight or ten feet and runs along within forty feet of the shore; on the other side will be an eddy and you have to drop her down and have her go very close to the rocks or hold her up with the wheel and let her nose drop down by until you get her straight to make the turn holding her; it is impossible to run right straight down. The width of it in the part where you

5101 can run your boat from rock to rock is about 300 feet.

That is, between projecting points on each side of the stream. But the current is only about forty feet wide and you have to stay in that forty feet wide because the eddy would catch us and drive us out of our course. This current forty feet wide makes a sharp turn dashing right against the cliff. When it makes the turn I don't think it is a right angle curve; it isn't quite, and just below the curve it goes all into whirls; there is no continuous channel below. That is "the eddy." We call it six miles from the head of Rock Island Rapids down to the foot of the Cabinet Rapids. The Dry Kiln Rapids don't amount to anything.

Q. Well still lower you come to the island rapids;

5102 there is another rapids some distance further down called the Island Rapids before you get to the Priest Rapids, but you say those don't amount to anything?

A. I don't remember them to amount to anything, because



I never paid much attention; we never had any name for them.

Q. Well, we will go down to the Priest Rapids; what sort of a rapid is that?

A. That sir, is—the river is filled from one side to the other, I think, from water's edge to water's edge is from 800 to 1,000 feet wide and between that there are quite a number of channels in between reefs. Where they go over that reef that extends—a succession of reefs extends clear cross the river, it is swift; between those places it is not very swift, but the reefs overlap; we go down through one reef and one place, then we have got to pull her across and drop her down in another place and go down that way, and just seem to veer across that way until we get down to the foot of the rapid where there is a great fall; it is almost—not exactly vertical, but it is a pour and when I was there, there was a rock but the Government had improved it; there was a rock in the middle

which made a very heavy swell, but that can only be  
5103 navigated in a medium or high stage of water. At the time we came down there the rock was still there but it has since been removed. I understand that the Priest Rapid is nine miles long; that it is what we considered it. At the lower rapid the current, in my estimation, is about 12 miles an hour. These reefs were the native rock in the bed of the stream, basaltic rock. They didn't seem to catch boulders as they washed down the stream; the boulders got mashed up to cobble stones before they got there. Our boat left Lake Osoyoos on the tenth of May and I don't remember the time we arrived at Des Chutes; probably—I couldn't tell you; I think

it wasn't over twenty days. I made the journey upward  
5104 from The Dalles, up to the lake again in 1888. I run the river that season with a steamer. I made one trip from Pasco to Okanogen up to Priest Rapids and the Rock Island Rapids, turned around and made four trips from Okanogen to Port Eaton, which is where the Chicago, Milwaukee & St. Paul Railroad now crosses the Columbia river.

The name of the town is Port Eaton; I don't think you will find it on the map. We called it that at the time; it is just a temporary name. It is just below Rock Island Rapids. I don't know whether you will find Johnston Canon there or not. They call it Ryansburg; it is right east of Crab Creek; you will find Crab Creek on the map there. Well, it is right on the other side of that; I ran from Okanogen down there, made four trips; then I



started up again and in getting over these Cabinet Rapids my engineer made a mistake and shot me into the current and broke the line and throwed a man down into the water and broke her nose right square off, and I had to haul her out and in hauling out I broke the capstan and turned around and went back and run down over Priest Rapids to Pasco, got a new capstan and came back again. Pasco 5105 is where the Snake puts into the Columbia. The steamer that I took through there in 1888 was 124 feet long, 22 feet beam, and had engines—

Q. What was the indicated horse power of the engines?

A. Ten inch cylinders, three foot stroke, very small power, 120 pounds of steam was all I carried, so that you can figure it out, I am not an engineer.

Q. How must water did she draw?

A. She drew about two feet.

Q. And what did she carry?

A. She carried,—the biggest load I had on her was about fifty tons.

Q. You spoke of the railroad coming in there; it is a general fact in the history of the country out there, Captain, that after they got those railroads all built they didn't use the rivers as much as they used to before they had any railroads, is it not?

A. Yes, sir, but they are running boats above this Rock Island.

Q. Now they are using boats again?

5106 A. They are still running them, have been ever since I took that boat up there. My freight was a miscellaneous cargo of supplies, groceries and supplies for use in the mines. I was carrying ore down at that time. Since then they have developed the wheat industry and are carrying thousands of tons of wheat every year. The Celilo Falls are 14 miles above the City of The Dalles, in the Columbia river. There are several islands in this stream, both above and below the Celilo Falls and in the river all the way. In high water there is no falls; there is quite a rapid but there is no falls. In low water there is a fall there of 37 feet; it is in the form of a horseshoe, falls around, the reefs come out of water on the right hand side and the reefs form a horseshoe and drop right into a channel right close to the Oregon side. That is, the cliff over which the river runs has washed back in the middle where the deeper water is and the greater amount of

friction on the rock. The whole river goes through  
5107 there. Take the front of the horseshoe, where the deeper  
passage is leaving out the two side places and it is prob-  
5108 ably 300 feet wide. I never passed a boat around these  
Celilo Falls. I have known it to be done. That has been  
done occasionally depending upon the condition of the water.  
The Dalles is six miles below the Celilo Falls. These Dalles  
are the places around which the Portage Railroad, that is  
adapted for the carrying of freight from the boats be-  
5109 low to the boats above, has been built. The "Dalles"  
in the Columbia means a wall, walls where the water runs  
through. At low water in these Dalles steamboats have been  
taken through it but in high water I understand the Govern-  
ment survey makes it that the whole of the Columbia river  
runs through a place there 185 feet wide, and when there is a  
flow of water the current is not very strong through there  
because they have sounded down 300 feet and didn't get any  
bottom, but when the flood comes it chokes at this place, and  
one year we had a boat, had taken her down through over the  
Celilo Falls and the watchman kept an account of the raise  
in the water and there was a hundred and forty foot raise,  
which backed the water up and destroyed the fall at Celilo.  
You see it is a choke in the river. I had made trips up the  
Snake river itself from Pasco all the way up to Lewiston. I  
first made that trip—we left the mouth of the Snake river on  
the 11th of September, 1861, and arrived at Lewiston,  
5110 being 40 days going up the river. We call it 155 miles.  
We didn't go quite four miles a day.

As to how much time it took in the down stream trip from  
Lewiston to Pasco, will say that coming down we were, I think,  
about four days, coming about forty miles a day. We didn't  
run at night either time. It wasn't safe to go at night. The  
Ainsworth Bar extends out from the Walla Walla county side  
of the river and extends up above the incline on the Ains-  
worth side until it gets right opposite the old south Ainsworth  
incline and then the bar extends right across the river, but  
there is a depression in it that we go through; I run that  
5111 for a good many years. The depth of water there is four  
feet and a half. I saw it when the ice was froze to the  
bottom and I was stuck drawing three feet of water right in  
the ice. That was about the lowest that they had there.

I know Captain Powell of the United States Engineers. I  
was well acquainted with him.

Q. He speaks of it having a minimum depth of three feet.

A. Well, he got it sometime when they didn't strike the right sounding. I can show you a line of soundings where they will show ten feet on the government survey and I will show you a dry reef sticking out of water four feet.

Q. It depends somewhat on the time of the year when they take it and the condition of the water?

A. They take the sounding at high water, and then reduce. They will take a sounding when there is six feet of a  
5112 raise. If they get nine feet, they will reduce it to three feet; that is the way they get a great many of their measurements. They don't sound in low water.

Perrin's Defeat is right at the head of Strawberry Island, and it is a narrow reef, extends almost across the river, and the channel is a little nearer the head of the island than it is over to the right hand shore, and it is a short break, deep water in the channel, but very narrow. It just comes through a little chute. The current is not so very swift; it is so deep water that you go up into it with speed and carry your weight right through; if you stop and go slow it will buck. The current will overcome your boat and it will come back. You have got to  
bottle the steam to make it. That is a common expres-  
5113 sion among steamboat men. To bottle the steam is to choke her down a little and get all the steam up you can on the boiler, hold the trottle.

Q. Now, what amount of obstruction would that process enable you to overcome, Captain? Assume that you had a boat going normally in the method you have described, and being overcome by a current she lays back and bottles the steam and shoots through. Take a boat that with her ordinary power is equal to making head against the seven mile current, would you be able by bottling the steam to overcome an eight mile current?

A. Well, that is owing to the power your engines have got.

Q. Well, I say, take an engine which with her ordinary load under ordinary conditions could just make head against a seven mile current, could she by bottling the steam make the passage through a chute of that kind of eight miles an hour?

A. No, sir, because if her limit of speed is seven miles an hour, that is all you can drive her, but if you have got slack water below she will come up with that speed and then her momentum will carry her through an eight mile current, yes,  
sir.

5114 Q. That is what I meant.

A. Yes, her momentum. "Perrin's Defeat" is called that because he went up there with a steamboat and couldn't get through. He took the boat and was going to Lewiston in too low water and he struck the mouth of the Snake river and the first rapid he came to he quit. That was in 1864. They never defeated me there. That never was know as "Gray's Defeat."

Q. There isn't any other shoal or rapid known that 5115 way, is there?

A. They have got one place where they call my defeat. Well, I went up to a rapid above Lewiston once and broke my line, broke my capstan and had to back out.

The COURT. Q. Is that the time you told us about this morning?

A. No, this was one trip when I was making a commercial trip up, and they called it "Gray's Defeat." I broke everything I had. Asotin is just six miles above the mouth of the river. That was in 1904.

I know Five Mile Rapid. That is just five miles from 5116 the mouth of the Snake river, four miles from Pasco. It is so named because of the distance from the mouth of the river. It is a short, very rough looking, a very rough place. In low water the water pours through a low lying reef and meets a reef extending out from the righthand side coming down, also a dry reef on the lefthand side. Then as you get below there is a reef fair in the middle of the channel that sometimes goes dry and it throws the current at a direct almost a direct right angle, and it is a very short fall there, I think there is about eight feet in the fall in a length of about 300 feet. When it becomes dry we do not stop running. We dodge into these holes and take our spars out and shove ourselves around. Sparring through, we only use the spars to push us out into the channel. You cannot get speed enough to steer. You go up the river and you come to Fish Hook Rapids. I have often run the Fish Hook Rapids. At the lower end of the Fish Hook Rapids there is a reef in 5117 the middle of the river with a shoal bar probably two feet of water in the channel off to the left, in the deepest channel; you move off to the left and directly over to the right it goes around a point on the reef, and you follow up through the swift water and gradually draw out into the center. And from that for about a mile or a mile and a half it is one continuous succession of reefs and shoals first on one side and then on the other. They are all submerged, just

under the surface. But there is a channel there that by careful manipulation you handle a boat there. These submerged reefs break up the surface of the water into hillocks on the top of the stream and make waves. We call Fish Hook Rapids a mile and a half long. The fall there is in the lengths—we had one surveyor that made it 17 feet, and another that made it 14 feet, and another that made it 23 feet, so you can form your own opinion.

Q. Well, by and by you get to Long Crossing Rapids, you remember those of course?

5118 A. Yes, sir, that is a shoal. That is the shoalest place on Snake river. It has an island on the lefthand side and the bar makes off diagonally across the river until from the foot of the island to where it joins another part on the other side is all of a mile. The water is pouring or dropping over this bar and we have to run very carefully for a little bit of a sag in the bar. There is just one place where we can get through by manipulation. In the little sag it is about three feet deep, probably not in low water, there isn't over two feet. There is probably six inches more in this sag than in the rest of it. We can run right over it when the water is up two feet. Part of it is made up of gravel

5119 just about the size of your two fists. It is called the Cobble Stone Bar. The length of the swift water in this Long Crossing Rapids is only probably 200 feet long, but the bar that runs across is probably about a mile long. Those Rescue Island Rapids are a number of basalt reefs that stand around promiscuously and it is pretty hard to work through them. There is an island in the stream on the lefthand side going up, but there is very little water goes behind it, most of it is on the righthand side. This island, that is what they call the island which has very little water going behind it, that is a bed rock reef, basalt reef that extends out and deflects the water right to the center of the island, and there is another reef that stands right out, right perpendicular and the island crosses on one side over to the other shore, and the rapids are scattered around considerably. It is

5120 quite a dangerous place. That Rescue Island Rapids is between a quarter and a half of a mile long. It has derived the name from an accident. There was a ferry boat broke a wire line out at Palouse. The ferry turned over and the man that was running it got on top of it, out on the bottom of his boat and drifted down onto the island, and he had been there a day or two when a steamer came along and they

launched a small boat and went out and got him. It is a very rough place in high water.

It is not so far above that before you come to the Pine Tree Rapids. Pine Tree Rapids is very similar to Pasco, except you follow the islands. There are quite a number of islands and the water goes around the channel out onto it, and the government has blasted a channel through there which some of us follow now. When I went through it there had been no improvements. We went with the boat, the widest place we could find when we went through there with 5121 the sail boat was 11 feet, and our boat was 12 feet wide.

We had to get a line out ahead and twist her along and lift her up. We got a line on the other side and twisted her around and in that way we worked her up. The trouble was to get a line out on the reefs that were submerged. The channel was pretty straight along the island, but it has been improved by the government. In the early days in '65 when the Colonel Wright used to carry freight up from Wallula up to that island, that point there, and then there was a boat up above, and we would bring the freight above and then carry it across, make a portage of it and carry it across the island to the boat above.

Trans-ship it on the new boat. I don't exactly remember how much depth there was at Pine Tree Rapids but there is quite a fall. From the hole in the wall to the foot of the island it was about three-quarters of a mile.

Q. Now, you spoke of Palouse, there were two or three Palouses?

A. There is the false Palouse and the Palouse Rapids.

Q. Take the false Palouse?

5122 A. Narrow straight deep water, not very strong and you have to dodge a little, dodge the current a little to get through. Then you come to one called the skiff bar. I remember the Skiff Bar Rapids. All that requires is dodging the boulders.

Q. There is rather a crooked channel there?

A. You have to wind around and dodge the boulders, average about five or six feet of water there.

Q. Well, you get to the Palouse Rapids, how much of a rapid do you have there?

A. Well, in high water the reef extends across the river, and it makes a very rough, boating whirl and it twists the boat there considerably and makes that very difficult for steering. The channel is about 80 feet wide, it was 80 feet



wide and I had the Government engineer take off about 40 feet last fall and widen it so high in water it would not be so rough. The Monumental Rapids, that is below Palouse, and it is a bar that extends right out on one side to the reef on the other, and the bar, the wash of the gravel from above encroaches on the reef and it makes it very difficult and dangerous. By the twisting from the bar you are liable to knock—on the reef you are liable to knock a hole in the boat or go on the bar and get ashore and it is probably a thousand feet from the shore, out to this narrow channel. You have to steady your boat and it is quite swift in low water. I have run those rapids, I could not tell you, two or three hundred times I have been over—thirty times in a season, that is in the extreme low water, but during the season I used to make a trip a week there for years. In the extreme low water you have to put a line out and hitch it, pull yourself through with the line and the capstan. The Texas Rapids is a wild looking place but it is like some people, it ain't as dangerous as it looks. It is about a mile long. It is about a fifteen foot fall, I would judge that. In the head of the rapids the channel through there has reefs that divert the channel and twist it around considerably, and then afterwards it goes over what they call Roll Rock. Then there are reefs or a low ridge in the center of the channel, and from the center you go from one side to the other and the water is quite rough, but by careful steering a man gets down without any trouble. Running up stream it is very strong, I have had to do—what do you call it, double teaming, double leading over it. I have had to put out a part of the load and take it up then come back and take the other part of it over. It would take going up stream to run through those Texas Rapids just about half an hour from the foot to the head, about a mile.

Q. When you are making time up stream at the rate of between three and four miles an hour, you did not make this mile and a half or mile and a quarter, whichever it was?

A. Well, we was all day getting through the Texas Rapid, and the Pine Trees we was two days getting through.

Q. You mean it has now been improved to such a degree that you are able to make it in from half an hour to an hour?

A. Yes, sir.

Q. But in its native condition it took you a day to go through it and two days to go through the Pine Tree?



A. Yes.

5125 I remember Granite Point and the rapids there.

Being asked how much of a rapid was there at Granite Point, will say it was not dangerous at all, there are several granite boulders that stand out close to the channel, and make a break. It is only dangerous in the night time. In low water those boulders there require close steering, that is all. The water breaks over the top of them. The water breaks over, they are right at the surface of the water, there is plenty of water in the channel. In making those trips from time to time you strike these places where the water breaks over them and makes waves and hillocks. There are places in low water where the boulders stick out through the water. You can see something like that at every one of these rapids where the boulders are present in low water.

As to when the first trip was made up the Columbia, 5126 up from Celilo to Lewiston that I know of, will say we

heard when we were living at the foot of Osoyoos Lake that a steamer had gone up the Snake river in 1860. This first trip up there was in '61. Captain Lem White, I know him well. He was the man that took the first boat up there. I remember his boat the Tonino. That is the boat.

With reference to Lewiston the Great Shoshone Falls must be 400 miles south. I have never been there. They are on the Snake river. The main channel of the Snake river comes up from the south to Lewiston and turns off to the northwest there. Away down somewhere on the line between Idaho and Utah are the Shoshone Falls.

5127 Q. You speak of a report of yours as being embodied in the United States Engineer's Report for 1884. I show you, Captain, United States Engineer's Report under the heading of Report of Captain Powell, Appendix Q. 4, Improvement of the Upper Columbia and Snake Rivers, Oregon and Washington Territory, Annual Report, Chief of Engineers, United States Army, Part III for 1884. Look at that and tell us whether this is the report?

This is the report beginning on page, the particular one I have directed your attention to beginning on page 2229 and you have now turned over to—

A. Have you the report for '85?

Q. I haven't it here. You mentioned '84 and I got the '84 report?

A. I made the examination in '84 and I saw the report in

there, I thought it was—I did not look particularly at the year, it was for the '84 year.

Q. It may be in the year '85 you think?

A. It may be '85.

Q. You don't find it here in the '84 report?

A. It may be in some of these—

Q. You see, here is the report of Philip C. Eastwick, Assistant Engineer, you point to a reference on page 2232.

A. This appears to be dated February 26, '84, and probably—I made my examination or reconnaissance in June and July, '84, it probably was not in there.

Q. The report to which I have called your attention 5128 begins on page 2229 and extends through to 2243. You spoke of being employed in '67 by the United States Engineer to survey a rapids in the Snake?

A. In the Columbia.

The engineer under whom I took employment at that time was Col. Williamson, Col. R. S. Williamson was in charge of the Pacific Coast as Chief Engineer and Lieutenant Heuer was in charge of the survey work, Lieutenant W. H. Heuer.

I spoke of a number of trips that I made on the Willamette river. I was running on the Willamette river in 1875; last, in the spring of '78.

As to what rapids I encountered on the Willamette river, will say there is the Clackamas Rapids, at Oregon City. That is the place where the old P. T. Company had built a dam across a slough in order to throw the water over a gravel bar and allow their boats to go up. This was on the left bank they built the dam. The channel off from the mouth of the Clackamas river filled up and they blowed out, blowed a hole in the dam on the left bank. We followed through close

5129 to the shore to the foot of the island and follow up, run up the tail race up to the dam and go through the dam that is broken. When the water is at low tide you have to put out a line up to the point of rock ahead and line through. Then after you get in that you are in a pool and you go around up past Oregon City and go into the Oregon City locks.

I was never up there before the locks were built there at Oregon City. I was up there in '64, hold on—I think it was '65 I was up there on a trip.

As to whether that was before there had been any improvement made on the Willamette, will say I don't know whether there had been any improvements, I was just on an excursion

and I didn't pay any attention to the improvements. There were no locks there that I recall.

Q. How much of a fall was there in those rapids you have mentioned?

CCOUNSEL FOR DEFENDANT. That is, if you know, if you observed them.

A. That one I went up first, I mean the one we ran up, my judgment would be about, there is about between three and four feet of a fall, in the length of the rapids, about half a mile. There is quite a shoal place over the bar until they broke a hole in the dam. After that there was plenty of water.

5130 Q. When you speak of the dam, you mean the natural dam formed there in the stream?

A. No, I mean the artificial dam, and when you get through there there isn't much water there, there is no water for steamboats, there is probably about two feet of water over the natural dam. But this artificial dam that they put in and took out again, left the hole in it, there is about 6 feet of water there.

Q. That had been put in with a view of narrowing up the stream, concentrating the water?

A. That has been done to throw all the water into this natural channel. They wanted to straighten it but they found they had to go around, it is a crooked channel.

Q. Yes, and a boat to make this trip, you made the trip both ways repeatedly before they blew out that dam?

A. I never made a trip before the dam was blowed up. I just made one trip up there with a boat. I did not know which way they went when the water was high, I paid no attention.

Q. That was a steamboat?

A. That was a steamboat.

Q. That was in '65?

A. '65, I believe.

Q. And when you were last on the river was during the period from '75?

A. Yes, sir.

Q. And at that time they had got the rock blown out?

A. Yes, sir.

5131 Q. But the steamboats had gone on through there during that period?

A. Yes, sir.

Q. You have spoken about going up into the Yamhill river and going to McMinnville?

A. The river was navigable just about two months in the year. Dayton is the low water head of navigation where they run, where the bar is formed by the emptying of the Yamhill, and for about two months in the year we run, or about one month of the year we run to McMinnville. I used to run from Portland every other day to Dayton in extreme low water,

for several months. Then we ran as far as LaFayette.  
5132 The mouth of the river, the mouth of the Yamhill river there was about three feet and a half of water, that is at times it falls off and is shallower and then they have got to dredge it, put a steamboat in there and dredge it with the wheel. The current of the Willamette running by the Yamhill would stop the sediment there. Then they would tie a steamboat in there a while and work her wheel and that wheel digs it out. Just by revolving the power wheel that would stir it up and the water would carry it off.

5133 Q. You spoke of going up into the Alaska and running on the Stirikine river? Describe that river to us, Captain?

A. Well, it is a river, the lower part is sand and drifts there, a great many, a great deal of trees and logs. In '77 I left Fort Wrangel on the 28th of April and ran to Glenora the first of May, following the ice up. As the ice melted and got out of the way we kept on going. It is 150 miles up there. As I said, the lower part of the river is shifting sand.

Q. How wide is the channel of the river down near the mouth?

A. The delta of the river is four or five miles but just the channel that we go through is probably about three feet wide. There are several islands formed all the way, and at one place up at what we call Hudson Bay Island, or Hudson Bay flats, the river is continually changing going up, never go up on the same channel. It is like a drift and a hole, the gravel and sand will lodge and then it will change channel and go around another way and you have got to pick your channel. Then you get up to the canon which is about 80 miles up; the

river changes above, but there is not so much sand and it  
5134 is more permanent. It has a rocky bottom when you get up and boulders, yes, plenty of them. Well, the shoalest stretch of water when you got up to the boulder on that run was about between four and five feet. I built two boats for that in the spring of '98, for a Klondike Mining Trading and Transportation Company. I went up in '77 first some twenty years before that. The boat I took up there on the first trip

in '77 was about 125 feet long and 24 feet beam. She drew about 22 inches light. She had a pair of 14-inch cylinders 4-foot stroke. I do not know the exact horse power.

5135 The Stikine river is continuous rapids. The Grand Rapids are up about 29 miles the other side of Glenora, the river takes a turn. Well, in coming down the river strikes a sandstone bluff and comes on down a little further about a quarter of a mile, following around the island bar—there has been a glacier off on the south side and it gradually, the wash from the glacier is gradually filling in. Well, that fills in and when the water, there is a hard boulder bar that it is hard to wash, don't wash, has formed an obstruction so that it throws the water right back under this moraine of the glacier and it turns quick to the left and then goes right in under the gravel and bank filled with sand and gravel and boulders. It makes a sharp turn into it and when it strikes that then turns it back to the right. It makes almost a Z with a sharp corner and you would try to drop your boat just as close to the bar as you can and let her hang on this bar until you pull her around across the bar so you can go down and go off, go over on the other bar and back that way. The current there is about 5136 twelve miles an hour. No boat ever went through without a line there. I think the Priest Rapids is a little the strongest, but it is the deepest and the water, we get more power than the Stikine, the deeper the water the more power it has got. The Stikine is shallow. Where that comes around the Z on the Stikine up at the upper corner it is probably eight or ten feet deep, then as we get down to the next corner with the water on the right, it goes over towards the island and it is gravel there about 3 feet deep, and from the point, over right in the corner it is probably six feet deep and right across then as it goes down right along the side of the perpendicular bank, perpendicular to the cut there the water is ten or twelve feet deep. That is the Grand Rapids of the Stikine. There are quite a number of shoals up above there, you have to wind around through it to go up the channel. Then you make several very short turns. You go over next to the right hand bank and then follow around until you are 5137 finally at the left hand bank and work between the islands. After you get through the sand, it gets lower down to the gravel, and you have to follow along very close to the growing trees. The trees almost overhang and you have to look out for them or they will take off your upper works. You have got to handle her very carefully for the

shoal water or the boat will run, what we call run, and then just as you get up to the head it is very shoal. If she turns off she will run ashore, cannot turn around. It ain't wide enough to turn around, she would go ashore. I have done that two or three times myself, get over there and the water would catch her and throw her onto the bank. Then you have got to spar and work off the little shoals, if you are shoal aft more than it is forward, you have got to line out and pull her off into the current. This Grand Rapids Shoal above 5138 there, makes a ridge in the river from below the foot of Grand Rapids to above the island shoals, probably four miles. I don't think it falls as much as the Priest Rapids, but much more than the Palouse. In '77 my boat was carrying supplies to the miners, carrying mules and animals up in there to the Cascera mines. They were mining gold there in '77 and had been mining for several years.

That does not go clear up to White Horse; that is a 5139 different river. I have taken a boat up to White Horse on the Yukon.

Being asked what is the condition of the Yukon up there at White Horse, will say as to the Yukon it is considered,—they call it now the head waters of the Yukon at White Horse, but up there they call it Fifty Mile river. It empties in about 30 miles below White Horse, empties into Lake La Barge and Lake La Barge empties into Thirty Mile river and the Thirty Mile river empties into the Hootalinqua and the Hootalinqua joins the Pellee at Selkirk and makes the Yukon. Take the Fifty Mile river where it goes into the lake, the width of the Fifty Mile river near its mouth is probably 200 feet or 250. The width of the channel in which the boats run where the water is deep enough for a boat is probably all the way from 150 to the full width of the channel, the full width of the river. At the mouth after you get into the river there is not less than six feet, except in one place, and after you get out into the lake then it shoals out and is there shoal and in low water 5140 in the lake there is about two feet and a half of water.

The lake was really only a broadening of the river. The lake is 30 miles long and about three or four miles wide. It comes down through and out into the Fifty Mile river below. The boats we built did not go up there, they were built in Victoria—Westminster and finished in Vancouver on the Stikine river. They were going to take freight, they were trying to establish an all Canadian route from Fort Wrangle to



Glenora or Telegraph Creek and then up by Teslin Lake and through the Hootalinqua river and in that way get into the Yukon country at Dawson. They were for use in connection with supplying the mines. I came to the White Horse Rapids in October, '99. I stayed there just long enough to get aboard of train.

5141 Being asked what has been my experience as a real estate man, will say I have made a whole lot of money at it and I spent it as fast as I got it. I first went into the real estate business, when I first bought—the first foot I ever owned in my life was when I went to establish a transfer of the Northern Pacific across the Columbia river at Pasco. I had to buy a piece of land to live on, and after I got a little piece I wanted more, and I kept on buying more and one time I owned several thousand acres. I still own a few pieces. There was a period when I left the business of steamboating and followed the business of real estate.

5142 When I was in the employ of the Northern Pacific I was looking out for their steamboat interests and I was carrying on a real estate business for myself and acting as local agent for the Northern Pacific Land Company, that was from about '87 to '92. I was captain of a steamboat at the same time, and doing real estate business for myself and for the company and was county commissioner and I don't know what all. I was actually operating, I was captain of a transfer boat which was carrying cars across the river, a ferry boat across the river. It was not necessary for me to be  
5143 on the boat. I was looking after the boat and this was outside, incidental; although I was here in '92, I was in Chicago and I was in Cincinnati a couple of months. I came here in July, '92, and left here on the 27th of December, '92, and went home. I was sick in '93 in the hospital for three months and a half. In '94 there was an immense flood up in the Columbia river and I took charge of running the steamer for the Northern Pacific Railroad Company from Ainsworth to Wallula to connect the two roads which was washed out, for about six weeks. And I was around home there a good deal of the time. Then in '95, I of course like everybody else, I went broke in '93, and in '95 I had to go to work. I commenced going round, I think it was in '95, it was in '95 I brought the steamer Norma down through the Snake river canon. That is between Huntington and Lewiston. Hunting-



ton is at the end of where the Oregon Short Line and the  
5144 O. R. & N. join. That is up above on the Snake river to  
the south. We went up 250 miles. The canon is be-  
tween Huntington and Lewiston. The canon proper is about  
four miles long.

Q. You say you made that trip in 1895?

A. Yes, sir, I believe that was the year.

Q. What was the boat?

A. Steamer Norma. I went over the rapids or Cascades,  
Copper Creek Falls was the worst. Copper Creek Falls is a  
perpendicular fall of about 18 feet and at about 200 feet or  
250 feet below the fall where it pitches over there is a cliff  
about 150 feet high standing right at right angles with  
5145 the current. The current has gone through there and  
the drift has disintegrated the rock until a part of the  
current runs under the cliff. As you pitch over this cliff it  
seems as though the boat were going to smash her brains out.  
You get a lot of water pouring off, there is a big river, and  
you go off there about 18 feet fall there, of course the sup-  
porting water will hold it up at an angle probably—ten de-  
grees, probably, ten degrees is pretty heavy. Anyhow the  
water runs very fast.

Q. Do you know where the place is they call the Seventy  
Mile Canon, or don't you remember that?

A. I don't know. There was no one aboard who had  
5146 ever seen the river before, we did not know where we  
were going. We found quite a number all the way from  
10 to 15 foot falls, all the way down. There are a few miles  
at one place where the river had to go through a clay bank  
with granite boulders. They had fallen in until the granite  
boulders were laying just as steep as they could lay and the  
water was going down there, and I assumed there was about  
200 feet of fall in about four miles. It looked like going down  
a chalk line, it was perfectly white. I stood in the pilot house  
and I could not see the water on either side. It was per-  
fectly straight, I could see the water ahead but I could not  
see the water on either side of the pilot house. I sup-  
5147 pose the water there was about 70 or 80 feet wide. I  
saw just the banks, fallen in, the rocks, the granite boul-  
ders that were lying there all the way, from the size of your  
head to 6 feet in diameter. That was located below the Cop-  
per Ledge Falls and 60 miles above Salmon river. We kept  
on encountering rapids. Finally we got to the mouth of the  
Imhaha, the Imhaha river where the Eureka and Fargo mines

are located now. There we found very difficult rapids. It poured through, these granite boulders had fallen in and there was—a reef comes this way on this side (indicating) and there is a basalt reef and granite boulders on that (indicating) at right angles to the bank of the river. And then at a 5148 point shifting out there, they had been shoved out there by a water spout and washed down and forced it right in there so that it makes that part circular rapids. The boulders project out into the stream out of the water, perhaps there is 100 feet to spare, but it is very crooked there and quite dangerous. When you get a little further you come to Sheep Rock, there is where the steamer Imhaha was wrecked. The captain was going through and had out a line there and pulled her through, but they were a little careless, or his men were careless in throwing the line overboard and it caught on the wheel and she turned down and ran on one side, one end on one side and the other on the other, right across the river. They jumped ashore as soon as they could and 5149 she just backed right off and upset a little way below.

The Sheep Rock projects some out into the stream at that point making rather a narrow stone cliff there. The Priest Rapids is stronger than that, it (Sheep Rock Rapids) is a little bit stronger than Palouse. It has got a cliff there at the side like the Priest Rapids, about four or three miles below it goes into the Salmon river. Where the Salmon river comes in it is more or less broader. Then the water throws out on the right side and there is a bar there probably 5150 60 or 70 acres. After it passes there its speed is about 7 or 8 miles an hour. I think it is fifty miles from the mouth of the Salmon river to Lewiston. For the fifty miles down stream it takes about two hours or two hours and ten minutes to run the distance. To go up stream it takes about 8 hours. I have gone up the Salmon river to the mouth of the Imhaha. That is as far as they ever have been. In '64 I was on a boat that was sent up there by the O. T. N. Company and tried to get through this Snake river canon and we got up about 25 miles above Salmon river and struck one of the bars that went across the river and knocked 14 5151 feet of her bow off and we turned around and came back. 1904 I believe it was when I quit the railroad, quit the company and went onto the Snake river, and was running up until December, 1906.

Q. And in '73 or '4 when everybody went broke all through the country you went into the butcher business?

A. Oh, no.

Q. Wasn't that the time?

A. '93 when they all went broke, I didn't go into the butcher business then.

Q. When was it you took up the butcher business?

A. That was in '83 and '4.

Q. That is what I say, in '73 and '4 was when some of us think was the worst panic we ever had?

A. We didn't know anything about it that far out 5152 west. I ran up Clear Water in 1863. It joins the Snake at Lewiston, Idaho, comes in from the north, no the east, comes in from the east. I went up it about twelve miles to the Lapway Agency?

Q. Have you been there since?

A. Not on the river.

Q. There is a railroad through there now is there not?

A. Yes, sir.

Q. That is quite a common experience out there where the railroad parallels the river, isn't it?

A. Yes, sir. They tried, there was a boat running on there a few years ago, tried to bring wheat down but they made a failure of it.

Q. Your idea would be then, Captain, that a river should be navigable if it was the only way to go, but not navigable if there was a better and cheaper way for a railroad along side of it?

A. It is possible to take some boats where it is not—would not be practicable.

Q. Meaning by that now it would not pay?

A. Where it won't pay.

Q. Yes, and you mean to be understood in that sense when you speak of streams being practically navigable or practically not navigable?

A. Yes.

5153 Q. And then its character would vary in that respect with the development of the country?

A. Yes, sir.

Q. And the other means of transportation, is that right?

A. Yes.

There are quite a number of swift water rapids on the Columbia between Pasco and Celilo. Squally Hook Rapids is pretty swift and it is difficult. You have to go between quite a number of bars and rapids to get up into the main rapid. The main rapids is straight and they are very strong and swift.

It is from the head to the foot probably three-quarters of a mile. In that distance the river falls, I should judge it was about ten feet, or an eight foot fall there, eight or ten. I have run that fall probably two or three thousand times. I know the Umatilla Rapids, upper and lower. They are just 5154 about at the town of Umatilla, on the Columbia river, between Pasco and Celilo. In the whole distance of two and a half miles there is a fall there at the upper Umatilla of 17 feet. We measured it at the time I was making the soundings and surveys. I have run both ways. I have run up in high water and in low water both ways. I took through there a flat bottom light draught stern wheel steamboat. The last boat I was running there drew 29 inches light. The boats, the average boat for the Columbia river draws about 30 inches light, when loaded with a load she would draw from 4-1/2 to 6 feet, and even brought down as much as 7 feet. I assisted in the survey for the purpose of improving the channel there at the Umatilla Rapids.

5155 That is where I said there was a current of twelve miles an hour.

As I understand, they have got out there, they show a current running at the gravel bar which is called the Lower Riffle, at nine miles an hour. The Yukon river from the mouth to the ramparts which is 800 miles up, is one continual mass of sand and down at the lower end it is pondry; that is a kind of mossy growth that grows in bunches right out into the stream. It grows right out in the islands, innumerable islands of ice. And the channels are, if a man knows his business—they are shifting considerably. After you get to the ramparts, then you have about 100 miles of rock, where its channel is defined and remains there the same. Dawson is about 800 miles down it is half way, the ramparts are. Then after you get above Fort Hamlin, which is about 50 or 60 miles above Ramparts, at Ramparts it commences to spread out again and it is full of innumerable islands, and the channels are very narrow and crooked and it divides and going through you would have to follow in one channel where it runs off by the island, and

5156 you have got to run the channel that you can find there.

It would be, places in extreme high water would be from 4 to 5 feet deep. In low water the same, because it goes out, the high water brings the gravel down and fills it up just as the river bed rises. I understand that the river at the widest part of the Yukon flats is 45 miles from water to water on one side, and that is not—all filled in between with a heavy

growth of cotton wood and even fir and tamarac growing there, and all those innumerable channels go through there, so that is the only place that I hired a pilot when I went through because I did not think it would pay to waste time hunting for the channel. He got me into trouble at one place. The narrowest channel, some places that would not be over 75 or 100 feet wide and four to six feet deep. When you get up to a little place called Fourth of July creek you have got a pretty fair channel, it is reasonably permanent. The bed of it, the bed of the channel is of hard rocks and you have 5157 no trouble at all in finding the channel there. It is lined with glaciers going down on both sides of the river and there are moraines running in on both sides above the river on the bank all the way up, and all the way we saw boulders sticking up out of the water, and had to work your way around between them. From Dawson up to White Horse it is continually the same, although there are a few places where, as at steamboat bar,—they have quite a number of islands that you have to go through. These islands are made very largely of glacier clay, cementing the boulders in place. They are made by the ice and they have crowded up there and you can go back and come up there in the summer time where 5158 the water has washed out and you can see the ice with trees growing on top of them.

That is what we call historically fossil ice; ice that has fossilized that is a great many years old. That goes up near Skagway. No, White Horse is the name of a rapids. It derives its name from the fact that it comes galloping like a white horse there. There are boulders and reefs in the stream. The stream is lashed into ferment all the way down. There was a boat on Lake Marsh, which crosses over to Caribou, where there have been boats running. As to 5159 whether the boats were actually run on the rapids coming down, will say no steamboats were run or can run up there through the White Horse. There have been several taken down, several steamers, small ones. One was the Nora, was about 80 feet long and 10 feet beam, and the Willie Irwin, about the same thing, and there was one other boat that was about 100 feet long, I forget her name. There have been I think four boats taken down over the rapids. They drew 5160 about two feet. The 80 foot boat carried about 400 ton up stream, she had about a 4 foot draught. The 100 foot boat drew about the same amount. The White Horse Rapids proper are about a mile long.

I have never been on the Pellee. I have heard a boat went up there 60 miles, but how much farther she could have gone

I do not know. I used this process of cordelling in the 5161 days of my early batteau experience. In a batteau, we took the line in a batteau right up to the bank and the men jumped out and go along that way and line up around those swift waters. And in warping, why you would take the skiff alongside and put your rope in it and carry the rope up above and then run the end back to the big boat and put it on the capstan and wind up there. And sometimes if the bank is good they just jump out and run alongside the bank with the line, pass the line up on the bank and make it fast and shove her out and wind her up. That is the practice in common use on the Snake and Clearwater and everywhere in the swift water streams, and it is still in common use on the Snake. Wherever a steamboat can go they put out a line, and then they handle it with the capstan. On the rapids above Lewiston there never has been a boat went up through there 5162 that was run without a line. Those boats that run on the Snake on their own power is still water when carrying the ordinary load of freight are about 12 mile boats. Coming down the stream sometimes on the Snake river we would go more than twice that fast. Well, I have considered that sometimes I went 35 miles an hour, but I wouldn't swear to it.

I arrived in Chicago on this occasion Saturday night at 10:05 and went down to the Desplaines river yesterday; 5163 on Sunday. There was with me Mr. Logan, Mr. Munroe and Mr. Norton. We left Chicago Sunday afternoon and went down with this party between two and three o'clock. We got back here about half past eight, I think it was; somewhere close to that. I didn't look at my watch. We come back by rail from Joliet and went by rail to Joliet. We used an automobile from there, made the trip from Joliet down to the site of this proposed dam and back again. I suppose 5164 I came on here for the purpose of giving testimony in this case. I didn't know what I was coming for until I got here. I received a message requesting me to come on, and I came in pursuance of that message; that came from the counsel for the defense.



*Re-direct Examination.*

Q. And you have traveled all over these rivers with Mr. Starr and noted their difficulty, and having that in mind, are you still of the opinion that the Desplaines river is not safely navigable for boats?

A. Yes, sir.

Q. You were asked whether you referred to navigability as compared to the use of railroads, when you said the Desplaines river was not in your opinion navigable. Did you mean that its navigation would not be commercially practicable in competition with railroads, or that it was not a navigable stream?

Objected to as not proper re-direct; overruled.

5165 A. It is most certainly not practicable in competition with railroads, and I don't think it would be practicable in competition with wagons.

COUNSEL FOR DEFENSE. Q. Having had your mind refreshed with all the difficulties that you have gone over, it is still your opinion that you could not safely take boats up and down?

A. Yes, sir, that is my opinion.

At Squally Hook in extreme low water in the rapids there is a depth of eight and ten feet. In the rapids proper there is a rock, right in the head, where the water is eight or ten feet deep, but at the lower end where it turns off, there  
5166 is only about four feet of water. The character of the bed there is broken rock and gravel. Well, it is boulders.

Q. Now, the upper Umatilla, what is the depth on the rapids there?

A. There is no place that you come over, except over a rock, except it has been blown out of the channel, where it is less than five feet at low water, but it is very crooked and an innumerable number of those channels that are much shallower than the one that we followed. The one we fol-  
5167 lowed at the extreme low water in our navigation had about five feet of water. The Yukon channel was probable 300 feet wide and about 5 feet deep, clear of boulders in the channel.

The White Horse Rapids are between 400 and 500 feet in width. It is not shallow. When I speak of depth I mean depth in the clear. The channel in the Stikine at the place where the trees come over, from bank to bank, is about 400



feet, but the channel probably where the boats could run, 5168 is not over 75 feet. Its depth was about  $3\frac{1}{2}$  feet and its bed was small gravel. At Five Mile Rapids there was a dry reef. There is no place in the channel proper where there is less than eight feet. At Fish Hook Rapids there was 2 feet of water on the left and the deepest water was on the right, about  $5\frac{1}{2}$  to 6 feet. The Long Crossing Rapids was the shoalest place in the Snake river and the depth of channel there at lowest depth was thirty inches.

5169 Q. And three feet at the channel?

A. Two feet and a half at dead low water.

Q. Yes. Now, the Rescue Island you said was basalt reef. What were the depths at the Rescue Island Rapid?

A. The reefs at low water protrude from the surface, but by going above, see-sawing down and going up and see-sawing down again, we got through the channel, and there was probably six or eight feet of water. At False Palouse I never saw less than eight feet of water.

Q. At Palouse Rapids itself, what is the depth of the water?

A. Unknown.

Q. Very deep?

A. Very deep. In very low water at the upper end of Palouse the boulders extend almost across, making the channel very swift, and they are only about five feet under water.

Q. Five feet under water?

A. Yes.

Q. That is at lowest navigable water?

A. That is at lowest navigable stream.

Q. What is the depth at Monumental Rapids under similar conditions?

A. About 30 inches, two feet and a half.

Q. That is clear of boulders?

A. Clear of gravel.

Q. At the Texas Rapids, what is the depth of low water?

5170 A. Texas Rapids, there is quite a depth there, near the head. We have to go over rocks that are about five feet under water.

Q. Now, Priest Rapids, what is the effect of high and medium stages of water upon Priest's Rapids?

A. It raises the water over a dry channel. It fills a dry channel on the Douglass County side and allows steamboats to pass up, around a canal, which is very swift and turbulent.

Q. What depth of water do you have then?

A. About five feet. I went down it and up it in a medium stage of water. It is navigable but it is only navigable at medium and high stage. At low water it pours right into a sluice which is probably a hundred feet wide and the whole of the river goes right through that one sluice, so I couldn't tell about the slope; it is impossible for a boat to climb.

5171 At the Cabinet Rapids there was more than ten feet of water. At Rock Island Rapids there is not an extreme amount of current there, and at the narrowest point I think the water was about 8 feet when I went through. But the water gets low, the channel that a steamboat has to go through becomes almost dry and the rocks stick out of the water. The water percolates through between innumerable channels that are not wide enough for a steamboat to go through.

Q. How do you get the steamboat through?

A. You don't get through there in low water. I 5172 wasn't at the Chelan Rapids at extreme low water; when I was there, there was about 8 feet of water.

Q. And on that trip you passed over the rapids near McLaughlin's Falls; what was the depth of the water there?

A. That I couldn't say; we figured that there was about three feet and a half of water.

Q. How much?

A. About three and a half feet.

Q. Hills' Bar, you said the river was 600 feet wide, fifty or sixty feet between rocks, a channel of 50 or 60 feet; that was the depth of the river at Hills' Bar?

A. I was very young at that time and I don't remember.

Q. Have you any distinct recollection as to the character of that bar at all?

A. I recollect having seen the rocks breaking in all directions and that we followed a certain channel. How deep it was, I don't know.

Q. You spoke of going in the "Norma." Now, turning to the Snake river, what year was it you went down with 5173 the Norma from Huntington to Lewiston?

A. I believe it was in 1885.

Q. Prior to that time the Government had done work on it, hadn't it, between those points?

A. Yes, sir; between Huntington and Seven Devils.

Q. Let me read this to you: I am reading from page 3532 of Part 5, Report of Engineers for 1901.

COUNSEL FOR COMPLAINANT. I submit that is not proper re-direct.

The COURT. Yes, you brought out about Huntington and that section, and he didn't in his.

COUNSEL FOR COMPLAINANT. Well, what I mean is, is as to the use of extraneous documents as a method of elaborating the testimony of the witness, is, I submit, not proper re-direct.

The COURT. I think it is proper under the circumstances. He may call his attention to Government Reports.

COUNSEL FOR DEFENDANT (reading):

5174 "In 1892, \$20,000 and in 1894 \$25,000 were, as before referred to, appropriated for the improvement of the Snake from Huntington bridge down to the Seven Devils mining district. Considerable work was done in freeing the river from obstructions in this locality; considerable plant was collected, including drills, scows, tools, etc., and the work of removing ledge rock and boulders was carried on for several seasons. Only one steamer, the Norma, was ever built for navigating this section of the river, and she made but one trip and then the owners abandoned the idea of running. In 1896 all the Govern-  
ment plant in this portion of the river was sold and the river improvement abandoned."

Q. That is the trip that you made, is it not, Captain?

A. Yes, sir, I brought the Norma down.

Q. And that is a correct statement, that is the only trip you ever made?

A. No, she made a trip down to Seven Devils and back.

The COURT. That is, from Huntington to Seven Devils?

A. I went from Huntington to Seven Devils and back to Huntington, and then she laid there until the next year and then I took her down.

Q. To Lewiston?

A. To Lewiston, yes, sir.

COUNSEL FOR DEFENDANT. That was the complete history of her experience on that part of the river?

A. Yes, sir.

*Re-cross Examination.*

5175 They are making some progress with the development of the canal all the way around The Dalles, but the canal is not yet completed. It will be a number of years to come before that enterprise can be completed. But there is navigation below it and navigation above it.

Q. You have a place there in the Columbia river where there are boats below and boats above, but the natural barrier at The Dalles is great that there isn't any navigation through The Dalles themselves.

A. Yes, sir.

Q. Is there any place like that, that you think of now on the Snake where there is navigation above it and navigation below it, but not through it?

A. No, sir; there is no such place as that. It is possible to take a steamboat through the Snake river canon, but there are no boats above since the Norma was brought down; I don't know but what there may be one. The Okanogon Lake is being navigated in British Columbia. The Okanogon river is being repaired by the Government so that boats can be taken up there from the Columbia river. They expect to run there about three months in the year.

5177 Q. Reading from this same report from which counsel read to you, a statement on the same page, "The Upper Columbia and Snake rivers having formed one of the most important highways of travel in the region in early days before the railroads were completed, Congress as early as 1872 made appropriations for the improvement of the Columbia, and in 1876 the Snake was added to the plan of improvement."

Do you accept the statement as correct that the Upper Columbia and Snake rivers formed one of the most important highways of travel in the region in the early days before the railroads were completed?

5178 The WITNESS. What is the question?

COUNSEL FOR COMPLAINANT. I simply put the question to you if they did constitute the main highways of travel before the railways?

A. They most certainly did, yes, sir.

Q. Now that the railways have been developed on each side of it, the rivers do not constitute the main highway of travel?

A. They do not, but we are making every effort to make them so.

Q. You are trying to hold on to them all that you can?

A. Yes, sir, trying to develop them. Our State appropriated \$125,000 for the improvement of the Snake last year.

5179

*Re-re-direct Examination.*

Q. Assuming, Captain, the Columbia and Snake constituted the most important highways of travel in early days, it was true, was it not, in that new country where you were brought up that every stream that was capable of navigation at all, some way was found to navigate it?

A. Yes, sir.

Q. Did you ever know a stream that was capable of being navigated that was not navigated?

A. I never did.

5180 In connection with the cross-examination of Captain Gray, maps of Oregon and Washington, which were used in his testimony (marked June 16 Exhibit 1, Oregon, and 2 Washington), were admitted in evidence. (Appendix, p. ....)

OTHER DATA.

3502 COUNSEL FOR DEFENDANT. I will read something from Parkman, which I wish to introduce. I read from pages 406 to 408 from Parkman's La Salle and the Discovery of the Great West, being the summary of Parkman as to the character of La Salle:

"Thus in the vigor of his manhood at the age of forty-three, died Robert Cavalier de la Salle, without question one of the most remarkable explorers whose names live in history. His faithful officer Joutel thus sketches his portrait: 'His firmness, his courage, his great knowledge of the arts and sciences, which made him equal to every undertaking, and his untiring energy, which enabled him to surmount every obstacle, would have won at last a glorious success for this grand enterprise, had not all his fine qualities been counterbalanced by a haughtiness of manner which often made him insupportable, and by a harshness toward those under his command which drew upon him an implacable hatred, and was at least the cause of his death.' "

This is the end of the quotation from Joutel.

3503 "The enthusiasm of the disinterested and chivalrous Champlain was not the enthusiasm of La Salle; nor had he any part in the self-devoted zeal of the early Jesuit explorers. He belonged not to the age of the knight-errant and the saint, but to the modern world of prac-

tical study and practical action. He was the hero not of a principle nor of a faith, but simply of a fixed idea and a determined purpose. As often happens with concentrated and energetic natures, his purpose was to him a passion and an inspiration; and he clung to it with a certain fanaticism of devotion. It was the offspring of an ambition vast and comprehensive, yet acting in the interest both of France and civilization.

Serious in all things, incapable of the lighter pleasures, incapable of repose, finding no joy but in the pursuit of great designs, too shy for society and too reserved for popularity, often unsympathetic and always seeming so, smothering emotions which he could not utter, schooled to universal distrust, stern to his followers and pitiless to himself, bearing the brunt of every hardship and every danger, demanding of others an equal constancy jointed to an implicit deference, heeding no counsel but his own, attempting the impossible and grasping at what was too vast to hold,—he contained in his own complex and painful nature the chief springs of his triumphs, his failures and his death.

3504 It is easy to reckon up his defects, but it is not easy to hide from sight the Roman virtues that redeemed them. Beset by a throng of enemies, he stands, like the King or Israel, head and shoulders above them all. He was a tower of adamant, against whose impregnable front hardship and danger, the rage of man and of the elements, the southern sun, the northern blast, fatigue, famine, disease, delay, disappointment and deferred hope empty their quivers in vain. That very pride which, Coriolanus-like, declared itself most sternly in the thickest press of foes, has in it something to challenge admiration. Never, under the impenetrable mail of paladin or crusader, beat a heart of more intrepid mettle than with in the stoic panoply that armed the breast of LaSalle. To estimate aright the marvels of his patient fortitude, one must follow on his track through the vast scene of his interminable journeyings,—those thousands of weary miles of forest, marsh and river, where, again and again, in the bitterness of baffled striving, the untiring pilgrim pushing onward towards the goal which he was never to attain. America owes him an enduring memory; for in this masculine figure she sees the pioneer who guided her to the possession of her richest heritage."

I also introduce page 276:

- 3050 "Chapter XX, 1681-1682. Success of LaSalle. His followers—The Chicago Portage—Descent of the Mississippi—The Lost Hunter—The Arkansas—The Taensas—The Natchez—Hostility—The Mouth of the Mississippi—Louis XIV. Proclaimed Sovereign of the Great West."

That is the chapter head on page 275. I begin reading at the bottom of page 276, the page heading being 1682:

"On the 21st of December, Tonty and Membre set out from Fort Miami with some of the party in six canoes, and crossed to the little river Chicago. LaSalle, with the rest of the men, joined them a few days later. It was the dead of winter, and the streams were frozen. They made sledges, placed on them the canoes, the baggage, and a disabled Frenchman; crossed from the Chicago to the northern branch of the Illinois, and filed in a long procession down its frozen course. They reached the site of the great Illinois village, found it tenantless, and continued their journey, still dragging the canoes till at length they reached open water below Lake Peoria."

- 3506 Again, in Chapter 21, beginning on page 289, the chapter heading being "Chapter 21, 1682-1683. St. Louis of the Illinois. Reading from page 209, the heading at the top of the page being "1683":

"Again on the fourth of June following, he writes to La Barre, from the Chicago portage, complaining that some of his colonists, going to Montreal for necessary supplies, have been detained by his enemies, and begging that they may be allowed to return, that his enterprise may not be ruined."

Also, on page 21, as follows:

- 3508 "After leaving the priests, LaSalle went to Onondaga, where we are left to infer that he succeeded better in getting a guide than he had before done among the Senecas. Thence he made his way to a point six or seven leagues distant from Lake Erie, where he reached a branch of the Ohio, and, descending it, followed the river as far as the rapids at Louisville,—or, as has been maintained, beyond its confluence with the Mississippi. His men now refused to go farther, and abandoned him, escaping to the English and the Dutch; whereupon he



retraced his steps alone. This must have been in the winter of 1669-1670, or in the following spring; unless there is an error of date in the statement of Nicolas Perrot, the famous voyageur, who says that he met him in the summer of 1670, hunting on the Ottawa with a party of Iroquois.

- 3509 But how was LaSalle employed in the following year? The same memoir has its solution to the problem. By this it appears that the indefatigable explorer embarked on Lake Erie, ascended the Detroit to Lake Huron, coasted the unknown shores of Michigan, passed the Straits of Michilimackinac, and, leaving Green Bay behind him, entered what is described as an incomparably larger bay, but which was evidently the southern portion of Lake Michigan. Thence he crossed to a river flowing westward,—evidently the Illinois,—and followed it until it was joined by another river flowing from the northwest to the southeast. By this, the Mississippi only can be meant; and he is reported to have said that he descended it to the thirty-sixth degree of latitude; where he stopped, assured that it discharged itself not into the gulf of California, but into the Gulf of Mexico, and resolved to follow it thither at a future day, when better provided with men and supplies.

- 3510 The first of these statements,—that relating to the Ohio,—confused, vague, and in great part incorrect, as it certainly is, is nevertheless well sustained as regards one essential point. LaSalle himself, in a memorial addressed to Count Frontenac in 1677, affirms that he discovered the Ohio, and descended it as far as to a fall which obstructed it.

Again, his rival, Louis Joliet, whose testimony on this point cannot be suspected, made two maps of the region of the Mississippi and the Great Lakes. The Ohio is laid down on both of them, with an inscription to the effect that it has been explored by LaSalle. That he discovered the Ohio may then be regarded as established. That he descended it to the Mississippi, he himself does not pretend; nor is there reason to believe that he did so.

- 3511 With regard to his alleged voyage down the Illinois, the case is different. Here, he is reported to have made a statement which admits but one interpretation,—that of the discovery by him of the Mississippi prior

to its discovery by Joliet and Marquette. The statement is attributed to a man not prone to vaunt his own exploits, who never proclaimed them in print, and whose testimony, even in his own case, must therefore have weight. But it comes to us through the medium of a person strongly biased in favor of La Salle and against Marquette and the Jesuits.

Seven years had passed since the alleged discovery, and La Salle had not before laid claim to it; although it was a matter of notoriety that during five years it had been claimed by Joliet, and that his claim was generally admitted. The correspondence of the governor and the intendant is silent as to La Salle's having penetrated to the Mississippi, though the attempt was made under the auspices of the latter, and his own letters declare; while both had the discovery of the great river earnestly at heart. The governor, Frontenac, La Salle's ardent supporter and ally, believed in 1672, as his letters show, that the Mississippi flowed into the Gulf of California; and two years later, he announces to the minister Colbert its discovery by Joliet. After La Salle's death, his brother, his nephew, and his niece addressed a memorial to the king, petitioning for certain grants in consideration of the discoveries of their relative, which they specify at some length; but they do not pretend that he reached the Mississippi before his expeditions of 1679 and 1682. This silence is the more significant, as it is this very niece who had possession of the papers in which La Salle recounts the journeys of which the issues are in question. Had they led him to the Mississippi, it is reasonably certain that she would have made it known in her memorial. La Salle discovered the Ohio, and in all probability the Illinois also; but that he discovered the Mississippi has not been proved, nor, in the light of the evidence we have, is it likely."

On page 24 there is a footnote 1, being the footnote following the paragraph which I read, which sets out the journey in 1669 or 1670, in which he states that he came to the southern portion of Lake Michigan and crossed to a river flowing westward, evidently the Illinois.

3512 "Fig. 1. Seymour.—After stating as above that he entered Lake Huron, doubled the Peninsula of Michigan, and passed La Baye des Puante (Green Bay) says:

Il reconnut une baye incomparablement plus large; au fond de laquelle vers l'ouest il trouva un tres beau havre et au fond de ce havre in et louve qui ca de o'est a l'ouest. Il sar suivet ce fleuve et estant parvenu jusqu'environs le 280me degre de longitude et el 39me latitude il trouva un autre fleuve qui secjoignaut au premier coulait du nordouest au sudest er il suivet ce fleuve jusqu'au 36me degre de latitude."

"Tres beau havre" may have been the entrance of the River Chicago, whence by an easy portage he might have reached the Desplaines branch of the Illinois. We shall see that he took this course in his famous exploration of 1682.

3553 COUNSEL FOR DEFENDANT. I now produce a book entitled "Illinois, Historical and Statistical," by John Moses, published in 1889, and I offer in evidence a portion of that volume, commencing on the bottom of page 76, and running over a part of page 77:

"The question of routes followed by early explorers between Canada and the country of the Illinois is as interesting as it has been provocative of discussion among the speculative antiquarians. But as the investigation is not now of much practical value to the ordinary reader, but little space will be given to it in these pages.

Perhaps the most prolific source of doubt and difficulty in the individual to positively trace and identify any particular route, arises from the confounding of newly discovered streams with those first discovered, the same name being required to do duty for rivers as distinct as the individuality of the explorers who first sailed or paddled a canoe upon them. Thus the name of the Chicago, in its various orthographies, was applied more or less indefinitely to the St. Joseph, the Calumet, the Desplaines, and the Illinois rivers. Both of the latter were also called 'the Divine.' It was also applied to the country adjacent to the southern portion of Lake Michigan. Such confusion of nomenclature renders it extremely difficult, if not impossible, to determine precisely what stream or locality was meant when either of these names is used by early writers. It must be remembered that the fountainhead of information for early explorers was the Indians. To them even the primitive mode of transportation by horses or mules was unknown. They knew of but one way to abridge or vary

the tedious marches through forests or glades: That single avenue of escape was found in the waterways, and the shortest practicable portage connecting these was welcomed as the easiest way to avoid the physical labor which they considered as degrading as it was irksome."

Cavelier de La Salle, *Margry* Vol. 2, pp. 81 and 82. It begins on page 32. The heading as translated is:

3568 "The letter of the discoverer to one of his associates," and this memorandum below, "the commencement is missing, but in order to complete it you can refer to the official relation of 1679 to 1671, of which the editor must have inspired himself in this letter, and the following one, because he copied them very often, and having always good care to leave out from his relation the difficult passages, where La Salle speaks of the trees, and names those of whom he complains."

The letter extends to page 93 and is signed by La Salle.

The letter beginning on page 206 of that volume and extending to the bottom of the page, to the word "Mississippi." It is a letter of the Father Zenobie Membre dated The  
3569 River of the Mississippi, 3 June, 1682:

"The prompt departure of M. de Tonty having prevented my writing to you further all that has happened to me since my departure from Fort Frontenac last year, I see myself obliged, after imploring your blessing, to go back in order to tell you the main happenings." (I have translated it very literally.) "Your Reverence has known the reasons which made me return to the Miamis in order to accompany from there M. de La Salle, and on his discovery of the sea, which I have done up to the present time. Since his arrival at the place mentioned we left from there with M. de Tonty some days before M. de La Salle, who joined us on Chicago, where another lot of his men joined us also, so that all were assembled at the beginning of January, 1682, at the place where Chicago enters into the river of the Illinois, and as it was frozen like the one we came from, we continued our route on the ice, pulling our canoes and belongings not only to the village of the Illinois, where we met nobody, all wintering somewhere else, but thirty leagues further down to the end of Lake Pimedy, where,

finding navigation open, we descended in canoes said river to the Mississippi."

3372 There was offered in evidence on behalf of the defendant the report of Jacob A. Harman, Sanitary Engineer, employed by the Illinois State Board of Health to that Board, and found in the report of said Board of Health for the year 1901, as follows:

3578 "Desplaines River—The Desplaines is a stream with moderate descent from its source to a point near the line of Cook and Will Counties, a few miles southwest of Chicago, where it begins a rapid descent. It makes a fall about 70 feet in eight miles, when just below Joliet it reaches a pool known as Joliet Lake, which continues nearly to its mouth."

Also, a portion of said report found on page 134:

"Stream Gaugings. Gaugings of the principal tributaries and of the Illinois river at Peoria were made during the low water stage in October, 1899, and represent approximately the average conditions of these streams during the late summer and early fall months. These gaugings were taken with a Price's current meter which had been previously rated by the United States Geological Survey. The beds of the streams were accurately cross sectioned and readings taken at the following stations:

Desplaines River—At wagon bridge about one mile below C. B. & Q. R. R. bridge near Riverside. Cross section was also taken at C. B. & Q. R. R. bridge for gaugings at higher stages of the river.

Flow 13.21 cubic feet per second. Turbidity .04."

Also a portion of said report appearing on page 159, being a table entitled "Resume of Precipitation on Illinois River Basin."

3580 "Sub-Basins.	1890	1891	1892	1893	1894	1895
Desplaines	35.82	29.03	35.98	29.03	27.80	30.48
Du Page				31.32	27.15	29.94
Kankakee	36.74	27.46	36.71	26.06	27.15	29.33
Fox	33.63	32.94	44.41	30.37	30.51	29.19
Vermillion	32.02	34.18	41.00	27.09	28.85	30.95
Mackinaw	26.33	41.70	40.84	33.52	27.80	33.26
Spoon			37.16	29.70	25.32	33.20
Sangamon	32.35	36.39	42.37	31.99	27.46	33.61

Crooked Creek	29.13	33.49	40.48	31.14	27.84	36.43
Macoupin Creek	29.47	28.69	44.24	35.43	28.74	32.65
McKee's Creek	29.13	33.49	42.03	36.08	28.52	36.82
Illinois River direct	28.19	33.92	40.93	30.61	26.65	37.72
Annual Averages	31.18	33.13	40.56	31.03	27.82	32.29
					Total	
Sub-Basins	1896	1897	1898	1899	Averages	
Desplaines	33.74	30.55	37.74	28.03	31.82	
Du Page	37.95	34.28	45.32	29.82	33.68	
Kankakee	35.05	31.48	42.11	28.18	32.03	
Fox	37.14	32.50	42.25	28.14	34.01	
Vermillion	36.21	32.96	42.34	28.60	33.52	
Mackinaw	35.37	29.43	42.96	29.62	34.08	
Spoon	35.52	29.70	47.34	31.94	33.74	
Sangamon	35.01	34.86	48.31	33.22	35.56	
Crooked Creek	41.43	37.08	51.07	37.39	36.55	
Macoupin Creek	36.97	37.17	49.46	37.20	35.90	
McKee's Creek	39.91	37.95	52.15	37.61	37.37	
Illinois River direct	35.05	33.12	46.77	33.05	34.01	
Annual Averages	36.61	33.42	45.73	31.90	34.36	

Also a portion of said report found on page 183, as follows:

3582 "The flow of the Illinois river at Peoria is made up of the combined flow of the tributaries above, including the sewerage from Chicago which reaches the Desplaines river at Joliet by way of the Illinois river and Michigan Canal. The Desplaines river at Riverside, a few miles above Joliet, goes entirely dry at that point nearly every fall and for days and weeks at a time there is no appreciable flow. On the Du Page river, which enters the Desplaines a few miles above the junction of the Desplaines and the Kankakee, no data as to the low water flow is at hand, except the discharge measurement taken under my direction in October, 1899, which shows 32.77 cubic feet per second. This flow is greater than that found in the Desplaines river on the previous day. The flow in the Desplaines at Riverside was 13.21 cubic feet per second. The waters of the Du Page are added to the Desplaines before they reach the Illinois so that the natural flow in the Desplaines, where it joins the Kankakee to form the Illinois, at the time of the

gaugings referred to were taken would have been approximately 50 cubic feet per second, while the amount of sewage flowing through the Illinois and Michigan Canal was 600 cubic feet per second. Practically all of the flow of the Desplaines river as it reaches the Illinois, is therefore, during dry weather, Chicago sewage.

Detailed observations of the flow of the Desplaines river at Riverside have been taken more or less continuously since 1877. The area of the drainage basin above this point is 630 square miles."

Also from page 187 of said report:

- 3583 "The Desplaines and Kankakee which are the principal head water tributaries of the Illinois, constitute about one-half of the drainage area above Peoria, the only other tributaries of considerable importance being the Fox river from the north and the Vermillion river from the south. The total drainage area of the Desplaines river is 1322 square miles and the Kankakee 5146 square miles. The Fox river 2700 square miles and the Vermillion river 1317 square miles. The total area of the Illinois Drainage basin to Peoria is 13,479 square miles."

Also a portion of said report on page 188, as follows:

"From the foregoing data it is quite evident that the contributions to the flow of the Illinois river during the dry periods come principally from the Kankakee river and the Fox river, the Desplaines and the Vermillion being practically dry at these periods. The sewage from the City of Chicago, as we have found, being equal to or greater than the flow of all the tributary streams, some allowance, of course to be made for losses by evaporation between the headwaters of the Illinois and Peoria."

Motion by complainants to strike out all passages read from said last report, as being direct quotations or readings of which the primary record has already been proven; also because done loosely and broadly for general health purposes, and not having in view the present inquiry.

- 3585 COUNSEL FOR DEFENDANT. We propose to put in certain reports of various engineers who, in early days were employed to examine and report the best route for the proposed canal, and in order that your Honor may understand how this report came about, I am going to offer in evidence certain statutes.



The Act of March 30, 1822, Congress authorized the State of Illinois:

“To survey and mark through the public lands of the United States, the route of the canal connecting the Illinois river with the southern bend of Lake Michigan.”

Act of Illinois Legislature approved February 14th, 1823 (laws 1823, page 151, statutes of 1856, page 419) Commissioners were appointed:

“To consider, devise, and adopt such measures as shall or may be requisite to effect the communication, by canal and locks, between the navigable waters of the Illinois river and Lake Michigan.”

Act of Illinois approved January 2, 1829, statutes of 1856, page 41, directing the Governor, with the consent of the Senate, to appoint three commissioners, biennially—

3587 “Whose duty it shall be to consider, devise and adopt such measures as may be required to facilitate and effect the communication, by means of a canal and locks, between the navigable waters of the Illinois river and Lake Michigan.”

Section 5 of said Act providing that the commissioners should have the territory of the state contiguous to the probable course of the canal, explored and examined for the purpose of fixing the most proper route, etc. Also providing that the canal should be at least four feet deep, and to be furnished with adequate locks, etc., to furnish navigation for boats of at least 75 feet in length, 13½ feet wide, and drawing 3 feet of water.

Also Section 7 of Act February 15, 1831 (Laws 1831, page 39, Revised Statutes 1856, page 426), authorizing the Canal Commissioners to employ an engineer, who shall examine the Illinois river, and if that river can be made navigable by dams from the mouth of the Fox to the head of steamboat navigation, then the commissioners shall have power to terminate the canal at the Fox river.

Section 13 of the same Act providing that the commissioners shall ascertain whether the Calumet river will be a sufficient feeder between the Chicago and Desplaines river “or whether the construction of a railroad is not preferable, or will be of more public utility than a canal.” That if the commissioners are satisfied with the sufficiency of the river, they are to commence excavation without delay.

There was also read in evidence from Senate Journal (Illinois), 1835, page 17, from the message of William Lee D. Ewing, acting Governor, dated December 2, 1834, addressed to the Senate and House, as follows:

3594 "I need not refer more particularly to the contemplated connection of Lake Michigan and the navigable waters of the Illinois river. A bill to incorporate a company for this purpose passed the House of Representatives at the last session of the General Assembly, and was barely lost in the Senate. Since that time the subject has been extensively agitated by the community, and the opinion of our constituents in favor of that measure comes to us with unbroken unanimity, and deep will be their disappointment and abiding their denunciation, should the action of the Legislature fail of being responsive to their wishes and their interests."

There was also read in evidence from the message of Joseph Duncan, Governor of the State of Illinois, to the Legislature, dated December 3rd, 1834, and found upon pages 21 to 29 of the same volume last referred to, as follows:

3595 "The construction of a canal from Chicago, on Lake Michigan, to the Illinois river, has long occupied the public attention, and the time has arrived, in my opinion, when a proper respect for the interests of this, and all the state, requires that the work be commenced and completed without further delay.

It is now more than seven years since Congress made a grant of land which was then supposed to be sufficient for the construction of this canal; which canal was then, and is now generally considered a work of greater national importance than any work of the kind that has yet been proposed to be made in our country. Such is the universal estimate of its importance by all men of intelligence, that I have no hesitation in believing that ample funds can be procured on the most favorable terms, for its speedy accomplishment. \* \* \*

In my judgment experience has shown canals to be much more useful, and generally cheaper of construction than railroads. When well made they require less expensive repairs, and are continually improving, and will last forever, while railroads are kept in repair at a very heavy expense, and will last about fifteen years. In the present case especially a canal should be preferred,

because it connects by a short and direct route, two great navigable waters, that wash the shores of most of the states and territories of the United States, and British provinces of North America; and thus opening a commerce between the remotest parts of the continent. By using the lake as a feeder to this canal a large body of water would be turned into the Illinois river, which will improve its navigation, and by increasing the current will, probably, render its shores more healthy."

Also from the message of Governor Joseph Duncan, dated December 4, 1838, addressed to the Senate and House of the 11th General Assembly;—found in the Journal of 1838-9, page 12, as follows:

3597 "The rapidly increasing commerce on those rivers requires an immediate improvement of their channels, and as the United States are bound to keep them open, by an agreement with Virginia, in the articles of cession, and with the governments of Ohio, Indiana and Illinois, in the following article of the ordinance of 1787, which was required to be made a part of the constitution of those states; to wit:

'Article IV. The navigation of the waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways, and forever free, as well to the inhabitants of said territory as to the citizens of the United States and those of any other state that may be admitted into the confederacy, without any tax, impost or duties therefor;'

and as to those two rivers, the Wabash and Illinois, are recognized to be the waters alluded to and the United States have provided for improving the carrying places between them and the lakes, there can be no doubt, when properly informed of the importance and necessity of such good faith and immediately cause every obstruction to be removed from their channels. I would therefore recommend that the subject be laid before Congress at its present session."

There was also read in evidence from

"Report of Canal Commissioners of the State of Illinois, made to the General Assembly, on the 3rd of January, 1825, accompanied by a map of the proposed canal, together with the law incorporating a company to open

a canal to connect the waters of Lake Michigan with those of the Illinois river. 1825."

Said report is as follows:

"REPORT, ETC.

VANDALIA, 3d January, 1825.

*To the Speaker of the House of Representatives:*

3600 Sir:—The Canal Commissioners have the honor to enclose the report required by 'An Act to provide for the improvement of the internal navigation of this state' approved February 14th, 1823, accompanied by the report of the engineers to them, with the maps, plans and documents relating thereto.

They are, very respectfully, your Ob't Serv'ts,  
(Signed) THOS. SLOO, JR., *President*,  
THEOP W. SMITH,  
EMANUEL J. WEST,  
ERASTUS BROWN.

The Commissioners appointed by an Act of the General Assembly of the State of Illinois, entitled 'An Act to provide for the improvement of the internal navigation of this State,' approved February 14th, 1823, most respectfully present the following report to the General Assembly, being a 'plain and comprehensive report of their proceedings,' as by the said Act is required.

The duties enjoined by said Act on the Commissioners are first, to consider, devise and adopt, such measures as shall, or may be requisite to effect the communication,  
3601 by canal and locks, between the navigable waters of the Illinois river and Lake Michigan.

Secondly, to cause that part of the territory of this state, which may lie upon or be contiguous to, the probable courses and ranges of said canal, to be explored and examined, for determining the most eligible route for the same; to cause surveys and levels to be taken, and accurate maps, field books, and draughts thereof to be made; to adopt and recommend proper plans for the construction and formation of a canal, and of the locks, dams and embankments, tunnels, culverts and aqueducts; and, to cause such plans, draughts and models to be executed:

Thirdly, to make calculations and estimates of the expenses of the foregoing operations:

Fourthly, to invite the attention of the Governors of

the States of Ohio and Indiana, and through them to the Legislatures of those states, to the importance of a canal communication between the Wabash and Maumee rivers.

3602 The commissioners met in Vandalia shortly after the passage of the Act referred to, and, after organizing the board, from various considerations, were of the opinion that they would best effect the intentions of the General Assembly by securing the services of one of the principal engineers employed in the construction of the New York Canal; and for the accomplishment of that object addressed letters to Messrs. Benjamin Wright, and James Geddes, who had been thus employed. Both these gentlemen having declined as will be seen by their answers herewith communicated, they employed a gentleman about to visit New York, to complete an arrangement with some competent person in that state, under the advice of the President of the New York Board of Canal Commissioners.

This gentleman's interviews resulting in no positive engagement, and considerable time having elapsed, they felt themselves compelled to seek some competent person, to execute the duties of engineer, within the immediate vicinity of this section of the western country; and they feel no small gratification in being enabled to say with confidence, that in their opinion, the duties which have been entrusted to and imposed upon the gentleman whom they have selected, have been executed with a skill and ability not surpassed by any one engaged in similar services.

As the country situated between the navigable waters of the Illinois river and Lake Michigan, is remote from the inhabited parts of this state, and the topography was imperfectly known, the Commissioners conceived it essentially necessary to a correct execution of the duties with which they were entrusted, to explore the country previously to the taking of the levels, and causing the surveys to be made; as without this examination, it was impossible to determine, with any accuracy, where the leveling and surveying ought to be commenced, the probable course to be run, or the point of termination; and, as affording the additional advantage of a correct data, for the ultimate execution of their duties, at the least possible expense.

A portion of the Commissioners, therefore, in the fall of 1823, accompanied by Col. Justus Post, whom they had engaged as their engineer, explored and examined the country from the rapids of the Illinois river, with the streams emptying into the same, to Lake Michigan; and the country bordering on the Chicago river and Calamie, which streams also empty into Lake Michigan. The Commissioners returned by water in canoes, examining the bed of the rivers, particularly the depth of the water, and the height of the river bank. They also ascended the Chicago river, or Arm of Lake Michigan, having its confluence with that lake on the west side, about 35 miles below the head of it, to the head of the river, 5 miles. From this point there is a portage of seven miles to the River Desplaines. They then descended the Desplaines 50 or 60 miles, to its mouth; where the uniting with the Kan-Ka-Kee, a considerable river from the southeast,  
3604 its source being in the country with those of the Wabash and Saint Joseph, the River Illinois is formed; thence down this river to its confluence with the Mississippi, 350 miles; thence down the latter 18 miles to Alton, the place from whence they had departed.

It is a source of much satisfaction for the Commissioners to be enabled to state, that the result of this examination eventuated in the conviction, that, from the mouth of the Illinois river, to the Little Vermillion, a handsome stream 12 or 15 feet wide, discharging its waters into the Illinois river on the west side, and about 4 miles below the rapids of the Illinois, there is not the least obstruction to the navigation, excepting in two or three places below Spoon river, in extremely low stages of water, where small sandbars show themselves, but which, however, can be easily removed.

Perhaps no river on the continent surpasses the Illinois in the facility and safety of its navigation, the current very gentle, and there being but few islands in the river.

From the mouth of the Little Vermillion, above referred to, neither the Illinois, nor the Desplaines is navigable in low stages of water, as they are frequently interrupted by rapids; but no serious obstacles present themselves, in effecting a canal navigation from the head of the navigable waters of the Illinois river, to

Lake Michigan; the valley of the Illinois and Desplaines, being an inclined plane, and the country between the Desplaines and the Chicago river smooth, flat prairie, with gentle inclinations to the lake.

The country being, as already remarked, uninhabited, the spring seasons extremely wet, and in summer the grass extremely high, the Commissioners, (thought) the proper time to make the requisite surveys, and levels, would be in the fall of the year, as the work could then be performed more accurately and expeditiously and with much less expense than at any other time. Under these considerations preparations were made to begin the leveling and surveying as early in the autumn of 1824 as the grass and vegetation could be destroyed by fire; this being an inseparable and preparatory act for the commencement of the work. To wait for this period, necessarily involved a further consideration, that there would not be time sufficient for one engineer to perform the work in season, to enable the Commissioners to make a report of their proceedings to the General Assembly at its present session; it, therefore, became necessary to employ another engineer, to assist in executing the levels, surveys, draughts and plans, and, accordingly, Col. Rene Paul, of  
3606 Missouri, was selected by the Commissioners for this purpose.

The engineers, with one of the Commissioners, proceeded, accordingly, with two companies, several of the members of which were occasionally left behind by reason of sickness. One of the companies to Chicago, on the shore of Lake Michigan and the other to the rapids of the River Illinois, with a mutual understanding to confine their operations of leveling to the north side of the Illinois and Desplaines, and the valleys of those rivers. The party at Chicago, after sounding and examining the depth of water on the lake shore, near the Chicago river, and sounding and meandering that river to its head, (the waters of which were found stagnant and on a level with the waters of Lake Michigan) proceeded leveling in a direction to the ford of the Desplaines, where it approaches, in its nearest point, to the Chicago river; then crossed that stream, and descended on the north side, until the company, which had



commenced leveling and surveying at the foot of the rapids, intercepted them.

3607 The object of the surveying and levelling, being to ascertain the summit level and inequalities of the surface of the country, between the Illinois river, at the foot of the rapids, and the lake, and to ascertain the inclination from the summit level to both the lake and the river, as well as the courses and distances, to enable the Commissioners to consider the practicability and probable expense of constructing a canal, connecting those points, immediate reference was not had to the actual location of the canal line, but throughout the entire route, great caution was observed in keeping on ground not sensibly affected by the inundation of river banks.

The Commissioners are fully satisfied of the practicability of the proposed communication, and of the facilities which the country, and the character of its resources, in general, afford for the completion of so great and desirable an object; and as the accompanying report and plans of the engineers, afford a more detailed, scientific and accurate exposition than they could possibly offer themselves, they refer thereto, for more minute and particular information than is contained herein; contenting themselves with stating the general results, which their own observations, and the examination of the various reasons connected with the information afforded by the report of the engineers, have enabled them to arrive at.

3608 From the ascertained levels, as described in the report of the engineers, it seems certain that the surface water level of Lake Michigan is 157 feet 11 inches and 7-10ths above the surface water level of the point at the mouth of the Little Vermillion river, as designated on the profile of the route by the engineers, where it is contemplated to connect the canal with the River Illinois.

Five routes are proposed, as will be seen by reference to the report of the engineers, but it will be understood that these five routes are not different ones altogether, but only variations of a portion of the upper part of the general route, lying between the head of the Chicago river, and a point on the River Desplaines, near the head of Isle a la Cache; and that from this point,

to the mouth of the Little Vermillion, all the routes are the same, excepting in that designated in the report of the engineers, from A to H, with the intention to use the water of Lake Michigan for a feeder; and after passing the River Desplaines, by an aqueduct, at the point H, to connect the canal with the principal line at K, and thence to the mouth of the Little Vermillion.

As these routes are all accurately and minutely described in the report of the engineers, the Commissioners deem it unnecessary to present in their report a recapitulation of them, and therefore, refer thereto, for the distance of each, the necessary excavations, with the number of dams, locks, aqueducts, culverts and embankments, and the probable expense of each.

3609 From an examination of the data assumed by the engineers, in their calculations of the probable expense of these different routes, the Commissioners are induced to believe that those calculations will not vary materially from the actual expense, and they are rather inclined to the opinion that the cost will not exceed, in any case, the amount of the estimate.

First route is estimated at . . . . .	\$716,110.71
Second route . . . . .	639,542.78
Third route . . . . .	668,289.68
Fourth route . . . . .	682,610.20
Fifth route . . . . .	689,746.96

These estimates, it is true, exceed considerably the general expectation, and the Commissioners are too well aware of the embarrassments in the financial situation of the state, at present, to indulge a well founded hope that immediate measures can be adopted, for executing a work of so much importance.

3610 The distance, as well as the general character of the streams, between the points designated in the surveys, and through which the communication is supposed to be effected, has been greatly misunderstood, and hence the amount of the expense, has been in public estimation, greatly underrated; but still, when a survey is taken of the great and various objects, and the peculiar beneficial results which would inevitably accompany the completion of this work, whether of a commercial or political nature, the mind ardently grasps at the projects, and hope leads it to the conclusion that the day

is not far distant, when, either by a great and persevering effort of the state, or by the magnanimous exertions of individual enterprise, this desirable and noble object shall be attained.

To this point, the attention of every enlightened mind within our state ought to be directed. It is one connected with the general interests of several of the states, and so intimately with our own, that in it is greatly involved the dearest and best hopes of our future wealth and importance. Every consideration, therefore, of interest, or of pride, ought to induce us to seek for the early adoption of measures, commensurate with its accomplishment. It is supposed that its execution might be effectuated by a liberal grant to individuals of the right to construct the same, with certain benefits accruing to them therefrom; but whether a monopoly of the kind would be an act of sound policy on the part of the state under existing circumstances, is a subject of serious consideration for the legislature, it is not, however, to  
3611 be denied in the present deranged state of our currency, that the state at this time, nor indeed for many years to come, can, in all human probability, even attempt the execution of the work. Under these considerations, it might be advantageous to the great interests of the state to encourage individual enterprise, as it is probable that by such enterprise alone this important work can be commenced and consummated within any reasonable period. What will, all circumstances considered, be the soundest policy to be pursued, is a subject for the consideration of those, to whom the general and permanent interests of the state are, or shall hereafter be confided.

The Commissioners forbear to add any further remarks on the importance of a subject, to which the attention of many of the most enlightened statesmen in the United States, has been a long time drawn, and which, in this enlightened age, is becoming one of the cardinal policies in all states.

The accompanying correspondence marked 'A,' will show what progress has been made in the execution of the duties imposed on the Commissioners, under the fourth head, as stated in this report. It is proper to remark, while on this subject, that no answer has been

received from the Governor of the State of Ohio, to communication addressed to him by the President of the Board.

The Commissioners, in concluding their report, will remark, that in presenting the account of their expenditure to the Auditor of Public Accounts, they are aware that the actual expense will have exceeded the appropriation made by the last General Assembly, yet, when the currency in which that appropriation was made, the great depreciation which it suffered between the time of its appropriation and its receipt and payment, with the deduction for interest on the bank notes, when drawn at the bank, and the nature and extent of the work performed, are considered, it will be satisfactorily perceived, that no work of equal magnitude, of the kind, has ever been performed at so cheap a rate.

THOS. SLOO, JR.,  
*President,*

ERASTUS BROWN,  
EMANUEL J. WEST,  
THEOP. W. SMITH.

Vandalia, 3rd January, 1825."

Counsel for defendant also read in evidence from the "report for the Canal Commissioners of Illinois to John R. Tanner, December 1, 1900, pp. 73 and 74, and excerpts from a letter of J. M. Bucklin, Engineer Illinois & Michigan Canal, dated December 18, 1830, to the Honorable Board of Canal Commissioners of the State of Illinois;"

3651 "To the Honorable Board of Canal Commissioners of the State of Illinois:

Gentlemen: In compliance with your instructions, I now lay before you the result of the surveys and examinations confided to me on that part of the proposed route of the Illinois and Michigan Canal, which is included between its entrance into the Chicago river and the western margin of the Ausogamashkee swamp, made with a view to its permanent location upon what has been considered the only practicable plan of obtaining a sufficient supply of water for the use of the summit level, assuming the bottom of the canal at its head to be four and one-half feet below the level of Lake Michigan.

From the mouth of the Chicago river to the point fixed upon as the entrance to the canal, there is no obstruction whatever to its navigation by boat drawing under five feet for that distance, which is five miles, this river forms a perfect natural canal, its banks being low and of uniform heights and its waters supplied by the lake.

Leaving the river at the point above mentioned, the line of the canal inclines toward the Regula (as will be seen by a reference to the accompanying map), and follows along the margin of the portage lake until it strikes the River Desplaines at the ford a distance of 3652 nine miles; the excavation throughout this distance will pass through a hard ferruginous clay (as has been ascertained by borings) at an average depth of 15.41 feet."

From page 74, I read:

"The River Desplaines when low affords a very inconsiderable quantity of water, but the Calimic river which empties into Lake Michigan about 12 miles south of Chicago, furnishes an abundant supply (320,000 cubic feet per hour) and in every respect, so far as my observation extends, advantageously situated as a feeder. Too much time was necessarily consumed in the survey of the line of the canal to admit of as particular an examination of this river as from the facts collected respecting it, it undoubtedly deserves."

Same report, pp. 88, 91 and 92, extract from a letter of J. M. Bucklin, Engineer Illinois & Michigan Canal, dated January 1, 1833, to Charles Dunn, Acting Commissioner Illinois & Michigan Canal.

Objection.

"Sir: Your instructions respecting the continuation of the survey of the route of the canal, and the examinations necessary to a correct understanding of the adaptation of the country between Lake Michigan and the Illinois river to the respective improvements under consideration, were observed early in the spring of 1831 by an examination into the practicability of making the Calamie river tributary as a feeder to the Illinois and Michigan Canal. Its successful result, although highly important as a means of avoiding a great source of expense in the event of the construction of the canal, was 3653

lessened in value by the development of unexpected obstacles, over which it had no control, in the process of a subsequent survey of the remaining part of the route of the canal from the termination of the survey of 1830 at the Ausoganashkee swamp to the navigable waters of the Illinois river.

The discharge of the Calamie river in the fall of 1830, a season of extreme drought, amounted to 320,000 cubic feet per hour, which may be safely relied upon as its minimum discharge. This quantity was considered sufficient for the upper portion of the canal, but by the late survey the length of the canal to be supplied from the summit until relieved by the River DuPage proving to be much greater than was anticipated, an additional supply of 102,400 cubic feet per hour will be required for its consumption. The River Desplaines in most seasons, would alone make up the deficiency, but in the fall of 1830 its discharge was at one period reduced to 60,000 feet per hour. Relying upon its contributing this quantity of water in the driest seasons, there will still remain a deficiency of 42,400 cubic feet for which there  
3654 is no resource but the establishment of an artificial reservoir on the summit level. The Ausoganashkee swamp presents great advantages for this purpose as it receives the drainage of the country to a great extent, and is susceptible at a comparatively small expense, of being rendered more secure from breaches and other casualties than most works of a similar description."

"It has been also proposed to effect a water communication between the lake and the Illinois river by means of dams and locks in the Desplaines, forming a still water navigation, knowing the minimum discharge of this river the impracticability of the scheme is so evident that the subject is here noticed more as a matter of form, than with any expectation of rendering it clearer. It will be recollected that the quantity of water provided for the passage of 96 boats over the summit level every 24 hours in the canal, is 86,400 cubic feet per hour, that is one lock chamber full of water every  
3655 fifteen minutes, ascending and descending.

The minimum discharge of the River Desplaines is only 60,000 cubic feet per hour. Of course, it is not

competent to supply even the lockage (which on this plan cannot be less than that required for the canal) without taking into consideration the loss by evaporation and leakage, which would alone consume at least seven times the quantity of water discharged by the River Desplaines at its lowest stage."

Same report, p. 135, letter from William Thomas, Chairman of Committee on Canals, etc., dated February 8, 1837, to the aforesaid J. M. Bucklin:

"Not being an engineer nor familiar with the calculations in relation to the quantity of water required to supply a canal of the size contemplated, I take the liberty of asking your assistance, and request the favor of you to review the calculations heretofore made by yourself and others in reference to the quantity of water in the Calamie, and to state the quantity required for the canal as at present proposed to be constructed. You will also state if there is anything peculiar in the nature of the country, to justify the erecting of a canal without providing the usual quantity of water for evaporation and leakage. All the documents, except the report made by you in 1830, will be furnished if desired.

Very respectfully,

Your obedient servant,

WM. THOMAS,

*Chairman of the Committee on Canals, etc."*

What I propose to offer is, first showing how this report came to be written. (Same report reply of J. M. Bucklin to the above letter of William Thomas):

3657 "Sir: It will give me great pleasure to afford you any information that I may possess in relation to the interesting subject which you have before you. I can, however, do little more than recapitulate the information that has been derived from various sources respecting it.

The River Desplaines was gauged, at Laughton's Ford, by Messrs. Post and Paul, in the first survey that was ever made of the route of the Illinois and Michigan Canal, and the discharge found to be 72,000 cubic feet per hour. They also gauged it and the Cache Island, 18 miles below, when they ascertained the discharge to be 117,000 cubic feet per hour. In October, 1829, it was



gauged by Dr. Howard, U. S. Civil Engineer, who places the discharge at 96,480 cubic feet per hour. At the same place (Laughton's Ford) it was again gauged by Messrs. Harrison and Guion, on the 8th of August, 1830, and found to discharge 60,000 cubic feet per hour. The Calamie river was gauged by me in the month of September, 1830, and found to discharge estimated at 320,000 cubic feet per hour. It was also gauged by M. Guion, assistant civil engineer, in the service of the United States, about the same time, and the discharge placed by him at 1,033,000 cubic feet per hour. It may be proper to remark here that the fall of 1830 was a season of extraordinary drought.

3658 On the Erie Canal in the State of New York, the supply not being very abundant in some parts of it, great care was taken to ascertain the quantity of water required to supply the evaporation and leakage in dry-seasons, and it was determined by experiments that on the middle and western division 100 cubic feet per minute per mile was a safe estimate 'with proper care in guarding against the waste of water.' On the eastern division 125 feet was required. On the canals in the State of Ohio, 100 cubic feet per minute was adopted as the minimum; and in the State of Indiana it has since been adopted as a standard in estimating the supply required for a canal of 40 feet surface, and four feet depth of water, except in one instance, where the canal passes through an uncommonly wet region of country.

The allowance of 100 cubic feet per mile per minute of evaporation and filtration was assumed by me as the basis of all calculations in deliberating the minimum quantity of water to be provided for the Illinois and Michigan Canal.

The surface of the canal as at present proposed to be constructed, is 60 feet, and bears the proportion of one and one-half to one to the surface of the canal as at first proposed. The depth of water is now six feet, whereas it was formerly four feet, consequently the pressure being as the squares of the heights, and the leakage nearly as the square roots of the heights, the pressure will be more than doubled, and the leakage (taking into calculation the great surface) increases in proportion to one and a half to one. The quantity of

water then that will be required to supply the evaporation and leakage in a canal of the dimensions proposed, 3659 will be 150 cubic feet per minute per mile; and with reference to the peculiar character of the country through which the canal passes, I know of nothing which will justify a departure from the established rule in regulating the supply of water. It is true, the upper level is situated in a very wet country, but the levels below dependent upon summit for water, are located on ground very badly calculated to retain it, and it is possible that more than the ordinary supply may be required.

If the project of supplying the canal from Lake Michigan is abandoned, and the high level resorted to, the length of canal, including feeders, to be supplied with water on the upper level, is 56 miles, which will require 8,407 cubic feet per minute to supply evaporation, and leakage, and a further supply of 2,112 for lockage, making in all a minimum supply of 10,512 cubic feet per minute.

Very respectfully your obedient servant,

J. M. BUCKLIN."

Counsel for defendant also read the following report of Benjamin Wright, an engineer, page 173:

3661 Dated Chicago, Oct. 23, 1837.

*"To the Board of Commissioners of the Illinois & Michigan Canal:*

Gentlemen:

Having been appointed by your honorable Board, under the third section of the law of the State of Illinois March 2, 1837, to survey and examine the route of the canal as now established, with a view of ascertaining whether there is a sufficient quantity of water, with the legitimate authority of the State of Illinois, to use, to supply a canal of the same size and dimensions, as the one now contemplated to be constructed upon the summit level of said line of canal; I have, in pursuance of the duties here appointed out, passed over the whole line of canal from Lake Michigan to Peru, examined all the plans and profiles, and received explanations and descriptions of every part of the work as projected and marked out, as well as all those parts now in progress of working under contract; and I think I may say I have now possessed myself of a full knowledge of the

details of the work, as designed by your chief engineer, in all its localities and bearings, upon the very important question of water, upon which I am required to act.

3662 It appears by the Act of the Legislature above referred to that 'a supply of water from sources within the legitimate authority of the State of Illinois, was to govern all actions upon this matter, and that your Board had early directed such river to be more fully examined than had heretofore been done.

From an examination of the various canal documents of the last session of the legislature, it seems that the question stands as follows:

Shall the feeding water be taken from Lake Michigan by a deep cut? Or shall the summit be raised 10 feet above the lake, and fed from streams to be brought into it? It has been supposed, and no doubt correctly, that only three streams of water can be brought on the summit level; First, the Desplaines river; then second, the Calumet river; third, the Fox river.

The Desplaines was not in a proper situation to gauge, as there had been copious rains; I, therefore, take the former measurements of the United States engineers, as stated in the reports of the Canal Committee, at 54,800 cubic feet per hour.

3663 By calculation it is found that, if 12 boats pass per hour, the lockage water to lock up and down 10 feet will be 475,200 per hour. If we then add for leakage at the locks (a small item), and for the evaporation, we ought not to say less than 500,000 cubic feet of water per hour will be required, when boats are passing as fast as they can be let through (or 12 per hour). It is true that, if boats passing each way were to meet so as to pass a boat up with the same water which passed one down, the only half above amount of lockage water should be estimated for the 12 boats per hour, although, I believe 12 boats per hour may be passed each way, if the locks are well attended, and are in perfect order for filling and discharging the water rapidly.

These premises being admitted, we have to look for 445,200 cubic feet of water per hour more than the Desplaines gives us at low water."

Then on page 146, same report. Pages 146, 147, extract from report of Board of Canal Commissioners submitted by W. F. Thornton, President, Jacob Frye, Acting Commissioner, to Thomas Carlin, Governor of Illinois, December 13, 1838:

"In the quarterly report of the Board, transmitted to the General Assembly in July, 1837, it was stated that the correspondence had been opened with Judge Wright, an eminently 'skillful engineer,' with a view of the surveys and examination required by the 3rd section of the amendatory law passed in the previous March. In the meantime Mr. Burnett, who is the resident engineer of the 3rd division, was instructed to make a critical and thorough survey of the dividing ridge between the Fox and Desplaines rivers, and within the limits of the state. This duty he performed with great care, eliciting information from every accessible source, and indulging those persons who desired explorations of particular depressions previously supposed and asserted to be sufficiently low to afford a cheap feeder.

Judge Wright arrived at Chicago in the early part of October, and on the 20th of the same month, Mr. Burnett made a detailed report, with a topographical map, and estimate of the quantities of excavations and other work necessary to effect the object on the most favorable route of the country, was susceptible. At that time, and through the whole summer, the Desplaines river was generally admitted to be unusually flush, as was also the Calamie. No gauges were therefore, ordered, and consequently, those of the Desplaines made by the United States Engineers in 1830, and of the Calamie, by Mr. Bucklin, were adopted as the basis of the investigation. Keeping in view, however, that the truth of these gauges had been strenuously controverted by the advocates of the upper level or 'shallow cut' and that capacity of the Calamie had been contended to be even superabundant, the attention of the examining engineer was particularly directed to the question, whether the Calamie could in any event be classed among waters which the law contemplated as 'sources within the legitimate authority of the State of Illinois'; a question which his reputation for sound judgment in everything connected with canaling, his knowledge of the requirements of Indiana dependent on the Calamie, and his great ex-

perience in the adjustment of similar claims, pre-eminently fitted him to answer with confidence. His plain, free and very decided report, marked 'G,' to which Mr. Burnett's is appended, will afford all the information required by the statute which enjoined the examinations. But notwithstanding the opinion of the Commissioners, that the report of Judge Wright,—so completely confirming their original plan—should alone determine the mode of feeding the canal, they still thought it advisable to seize the first opportunity of regauging the summit streams, and examining the suitability of the country for sustaining assistant reservoirs. The past dry season rendered the measuring of the Desplaines almost unnecessary, since, for nearly four months the tightest dam that could be erected, would  
 3666 not at the point for taking out the feeder, have saved water enough to propel a single pair of ordinary mill stones. Repeated gaugings from the 20th of July to the 22nd of August, and it was afterwards still lower, gave an average of less than the measurement of 1830."

COUNSEL FOR DEFENDANT. I want to, in connection with this, to call attention also to the act of the revised statutes of Illinois of 1908, Ch. 121, Section 265.

"That all bridges now constructed, or hereafter to be constructed, over the navigable portion of the Illinois river, there shall be built, and kept in good repair bridge pier booms."

3667 Thereupon counsel for defendant introduced in evidence extracts from the following report of the Canal Commissioners, dated December 13, 1838, addressed to his Excellency Thomas Carling, Governor of Illinois, read, page 20:

"From Norman's Island to Dam No. 1, which is located upon canal land just above the Town of Joliet, two strong walls with embankments between them will be constructed upon the east side to confine the water in the pool of the dam. It is proposed to raise these walls and embankments seven feet above the comb of the dam, to be perfectly secure from the highest floods. From Dam No. 1 to Dam No. 2, a similar defense will be required to a much less height. Both dams will be made  
 3668 of good cut stone masonry laid in hydraulic cement.

Dam No. 1 will be connected with lock No. 5 which will be upon the west or towing path side. Here also a large amount of water power will be created, which at this point will be particularly valuable and confer great additional value upon the state property."

3669 Thereupon counsel for defendant offered in evidence a certified copy by Christopher Mamer, Clerk of the Supreme Court of the State of Illinois, the certificate being dated April 1st, 1908, of a stipulation in the case of Philo A. Haven and Orlando H. Haven *vs.* Board of Trustees of Illinois and Michigan Canal, filed in that office on the 11th day of June, 1849.

3670 COUNSEL FOR DEFENDANT. There is a stipulation as to an order of the court; final judgment. I do not intend to read this entire stipulation, at least not at this time, but I offer it all in evidence.

3671 I will read the whole of it. Said document is as follows:

<p>"Philo W. Haven &amp; Orlando H. Haven <i>vs.</i> The Board of Trustees of the Illinois and Michigan Canal.</p>	}	<p>Will Circuit Court October Term, A. D. 1848.</p>
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The plaintiffs and defendants in this cause agree upon the following statement of facts to be submitted to the court for their decision thereon.

1. The plat hereto annexed numbered (1) is a plat of Section Sixteen in Township Thirty-five North, of Range Ten East of the Third Principal Meridian and also the plat of Section nine in the same Township being two plats of said section as returned by the Surveyor General of the United States and deposited in the land office at Chicago, on which said plat is represented the Desplaines river as it runs through said section.

And it is admitted that said Desplaines river is meandered through the entire length of said sections as appears from the minutes of said survey in the said Surveyor's Office, a copy of which minutes are also attached marked (2) and delineated on said map.

It is also admitted that said Section Sixteen is one of the sections granted by Congress to the State of Illi-

3672 nois for the use of the inhabitants of the township in which the same is situated for the use of the schools and accepted by an ordinance accepting certain propositions made by Congress April 18th, 1818. On the 26th of August, 1818. It is also admitted that the plat hereto annexed marked (3) is a true copy of the plat of said Section Sixteen and duly laid out and subdivided and certified and acknowledged and recorded according to law as set forth on said plat; and a plat of said river, and canal, with the dams, basins and locks, as made and constructed from Lockport  $4\frac{1}{2}$  miles, above the said plaintiff's mill dam to and below plaintiff's mills is hereto annexed marked No. 41.

It is also admitted that at a sale of lots in said Section Sixteen in October, 1834, by and under the authority of the state in pursuance of the statute in such case made and provided, John H. Kinzie, purchased lots one and two in block 57 and that patents issued to John H. Kinzie for the same in 1835 conveying title and fee simple as by law directed and that said John H. Kinzie conveyed to Martin H. Demmund and John M. Wilson his title as above stated and that Martin H. Demmund and John M. Wilson subsequently conveyed the same to the plaintiffs herein, lots one and four in block 56 were sold at the sale of said Section Sixteen in 1834 and were afterwards purchased by the plaintiffs for taxes and a deed bearing date obtained of the sheriff and they have until this time remained in undisputed possession of said lots except so much of them as has been appropriated by the canal. It is admitted that the Illinois and Michigan Canal was commenced in 1836 and that portion of the canal through said section was put under contract in 1838 and the Guard Lock on Section Nine near the dam across said river just above said Section Sixteen was commenced in 1840 by digging the pit in the spring and a part of the stone laid in the fall. The stone for the same were quarried and dressed during the spring and summer of the same year. The stone for the said dam on Section Nine (which is a cement and cut stone dam) were commenced the same season and the dam was commenced the following season in being quarried and cut in the spring and finished in the fall of 1841, the contracts for building said lock and dam were made



in 1839 and it was generally understood as early as 1839 that said lock and dam were to be built. It is agreed that in the spring of 1839 the plaintiffs commenced building a mill on said lot one in block 57 on Section Sixteen, and also a dam across the Desplaines river connecting said lot one in block 57 on the east bank of said river with the division line between lots one and four in block 56 on the west bank of said river and completed said dam and sawmill so as to use the same in the following October or November. Soon thereafter the

3674 Commissioners of the Illinois and Michigan Canal in constructing said canal reserved the west end of said dam so that it became connected with the east bank of the canal, which bank encroached upon the material channel of the river about ten feet. The head and fall at said plaintiff's dam used by them in propelling their machinery is six feet leaving a fall on said lots one and two in block 57 of about six inches more. In the year 1842 the plaintiffs also built a grist mill on said lot two in block 57, also added to the sawmill a lathe mill in 1843 and built a dwelling house on said lot one in block 57 in 1846 and also a machine shop on said lot one in block 57 in 1847. Said mill and buildings have been used by the plaintiffs for the uses and purposes for which they were built from the time they were built as aforesaid till the 20th day of April, 1848. The water in said river being at times insufficient for all said machinery. On the 29th of April, 1848, the defendants diverted or caused to be diverted into the canal for the use of said canal from the material channel of the river the whole or principal part of the waters of said river by turning the same from the basin made in said river by means of the dam on Section Nine being a canal section and about  $\frac{1}{2}$  mile next above the dam of said plaintiff

3675 so that the plaintiffs are wholly deprived of the use of the water at their said mills and have not since been able to run their machinery. From the time of putting this portion of the canal under contract in 1838 and up to the year 1843 there had been no change in the original plan of supplying the canal with water upon Lake Michigan by the deep cut as originally contemplated, and all contracts let previously to 1834. And all the arrangements of said canal were made notoriously upon the plan aforesaid and with a view to supply the

canal from Lake Michigan. It is also admitted that the Desplaines river is not navigable in fact although a portion of it is declared to be so by act of the legislature, the work upon the canal commenced being suspended in 1841 and was entirely suspended from 1842 to 1845. The question of law arising from the state of facts is whether the plaintiffs are entitled to compensation for the injury and damage they have sustained in consequence of the diversion of the water of the Desplaines river as aforesaid into the canal as aforesaid, and it is stipulated and agreed that whichever way the judge decides said question either party shall have 30 days from and after notice of said decision to take an appeal therefrom or bring a writ of error to the Supreme Court if the said decision shall be made in favor of the plaintiffs by the Circuit Court and the defendants do not appeal therefrom or bring a writ of error within the time aforesaid or if upon appeal the Supreme Court shall decide in favor of the plaintiffs' right to recover their damages as aforesaid then appraisers shall be appointed by the judge of said Circuit Court to appraise the damages under and in pursuance of the 9th section of the Act of 2nd March, 1837, and party reserving the right to make objections to the report of said appraisers before the Circuit Court and to appeal from the decision or order of the Circuit Court upon such appraisal as provided for in said act.

COLLINS & WILSON,

*Plffs. Attys.*

I. N. BUTTERFIELD,

*Atty. for Defts."*

Certificate of C. Mamer, Clerk of Supreme Court attached to above.

3764 There was then offered in evidence on behalf of the defendant portions of the report upon the survey of the Illinois river signed by James H. Wilson, Lieutenant Colonel, 35th Infantry, Brevet Major General U. S. A. and William Gooding, U. S. Civil Engineer and Brevet Major General A. A. Humphreys, Headquarters Corps of Engineers, Washington, D. C. The report is dated "United States Engineering Office, Davenport, Iowa, December 17, 1867." It is headed "Report upon the Survey of the Illinois River," and begins at page 438 of volume entitled "Messages and Documents,

War Department," and the title page reads, "House of Representatives, 40th Congress, 3rd Session. Ex. Doc. 1, pt. 2. Message of the President of the United States and Accompanying Documents"—A part of the message of the President, and one of the accompanying documents.

The portion of said report referred to is as follows:  
3765 "General: Having been designated by direction of the secretary of war, through engineer orders dated Washington, May 8, 1867, as a board 'to conduct surveys and examinations, and to prepare plans and estimates for the system of navigation by way of the Illinois river, between the Mississippi and Lake Michigan, adapted to military, naval and commercial purposes, in accordance with the act of March 2, 1867,' we have the honor to submit the following report:

In carrying out the instruction of the engineer department, we have steadily kept in view of the following considerations:

1. The selection of the best route for the purposes proposed.

2. The capacity which should be given to the improvement so as to adapt it more fully to the requirements indicated in the orders of the War Department.

3. The accomplishment of the object with the least possible cost consistent with the magnitude and permanency of the improvement, and in such order as to secure the greatest advantage to the commerce and navigation of the country.

"A detailed report of the results of the survey of the Illinois river during the latter part of 1866, under the direction of Brevet Major General J. H. Wilson, was made on the 17th of February, 1867, but as his operations were confined to that part of the river below La Salle, it was thought necessary to continue the surveys to Lake Michigan by all the possible routes, before absolutely fixing the details of the plan of improvement. Accordingly, at as early a date as the season would permit, we organized, under the general authority heretofore cited, three surveying parties under the immediate supervision of Civil Engineer Assistant James Worrall, for the purpose of making a thorough and exhaustive examination of the entire region lying between the southern and western end of Lake Michigan

and La Salle on the Illinois river, and also for the purpose of conducting a low water survey of the river from La Salle to its mouth. To the first of these parties, under Civil Engineer Assistant George Butler Griffin, and afterwards under Civil Engineer Assistant H. Alppers, was assigned the duty of surveying the line of the canal from Chicago to La Salle, the Desplaines and the Illinois rivers, and all the alternate lines which had at any time been spoken of, including that of Mud Lake."

3767 Also, from page 440 of said report:

"General consideration of the proposed improvement.

No fact can be better established than that the system of navigation between the Mississippi and Lake Michigan, by way of the Illinois river, should be adapted to the steamboats and barges employed in the navigation of the Mississippi and its principal tributaries, and not to ocean and lake vessels, except such as are required for the defense of our lake commerce and cities. In other words, the produce of the west, on its way to eastern markets, must be transferred to a different class of vessels as soon as it reaches the lakes; and hence in determining the dimensions of the canal; it will be amply sufficient for all practical purposes to arrange it for the navigation of the largest class of river steamboats. It will be remembered that the western steamboats are built with overhanging guards, so that a boat 75 feet wide over all will not usually exceed 45 feet in the hull. \* \* \*

It is true that it has long been generally understood that the only practicable route for such improvement from Lake Michigan to the Illinois river would be to follow the course of the present Illinois and Michigan Canal from Chicago until a point was reached where it would be expedient to improve and occupy the river, rather than enlarge the canal to the requisite dimensions.

This canal, from a point eight miles southwest of Chicago, follows the valley of the Desplaines, a tributary of the Illinois, until it forms a junction with the Kankakee river, some 50 miles southwest of Chicago, below which the river is known upon the map as the Illinois. The latter name would have been more appropriate for the Kankakee above that point, as it is the main river,

and Desplaines, in low water, contributes a comparatively insignificant quantity to its volume.

The Kankakee supplies water sufficient to make a good slack-water navigation; the Desplaines of itself does not, and although the direction of the former was such that it was not probable that a favorable connection with Lake Michigan could be made through its channel, yet it was deemed advisable to determine that fact beyond cavil."

3763 Also on page 442:

"The Desplaines river rises in the State of Wisconsin and runs nearly due south, parallel with the lake shore, and generally not more than eight or ten miles from it, until it reaches a point about thirteen miles in a southwest direction from the mouth of the Chicago river. Here is a slight depression, a mile or more in width, extending across from the Desplaines to the south branch of the Chicago river, through which a part of the waters of the former river—in time of floods flow into the lake. In this depression is what was known once as Portage Lake (so designated on the old maps of the country), but now better known as Mud Lake, a succession of shallow ponds on the same level connected with each other and with the Desplaines river and extending about six miles towards Chicago river. This was the portage or carrying place between the waters of the lakes and the Mississippi made memorable by the early French voyageurs, and so well known to the four traders. But Portage or Mud Lake has ceased to exist, the shallow ponds having been drained, and the impassable swamps rendered valuable land.

There can be no doubt that through this depression there was once an outlet from the lakes to the Mississippi, which was closed by the recession of the waters of the lakes. Even now, at the present stage of Lake Michigan its surface is only between 8 and 9 feet below this summit. The Desplaines river, from the depression described, changes its course and runs in nearly a southwestern direction until it forms a junction with the Kankakee. The river itself, except in floods, is very shallow, being often reduced in dry seasons to a mere brook, discharging less than one thousand cubic feet of water per minute. But the valley averages a mile wide

and is terminated on both sides by well marked terraces which become higher and higher as they approach the Illinois. Evidence at every step presents itself that the water, when this was the great outlet of the lakes, extended from bluff to bluff."

3770 Also, from page 444, as follows:

"For half the distance between Lockport and Joliet, no advantage can be gained by any deviation from the present line, but some expense may be saved by a different adjustment of lockage on the enlarged canal.

Below this point three different lines were surveyed to the head of Lake Joliet, an expansion of the Desplaines river, two miles below the City of Joliet.

The first of these lines follows the present canal through Joliet, and the pools formed by the two dams across the Desplaines now in use would be occupied by the proposed improvement. These dams are built of stone upon a rock foundation, and, having stood more than twenty years without injury, may be regarded as sufficiently permanent. It will require considerable rock excavation under water to form a channel of sufficient width for the proposed improvement, and there will be considerable difficulty in obtaining the necessary room at and near the two dams without injury to the improved property, or that which is regarded as very valuable. A short distance below the lower dam for the proposed improvement would leave the present canal and be made as direct to the head of Lake Joliet as practicable."

There was also read in evidence, from the document "Annual Report of the Chief of Engineers, U. S. Army, part III, 1884," the title page being: "48 Congress, 2nd Session. House of Representatives. Ex. Doc. 1, pt. 2, Vol. II. Annual report of the Chief of Engineers, United States Army, to the Secretary of War, for the year 1884. In four parts. Part III. Washington: Government Printing House, 1884," and therein from page 1958, which is headed: "Survey of Illinois and Desplaines rivers, between La Salle and Joliet, Illinois," signed by W. H. H. Benyaurd, Major of Engineers, as follows:

“United States Engineer Office,  
Chicago, March 5, 1884.

General:

I have the honor to present the following report upon the survey of the Desplaines and Illinois rivers from Joliet to La Salle, with estimates of cost of improvement, as provided for in the river and harbor act passed August 2, 1882.

The survey party, under the charge of Mr. George Y. Wisner, assistant engineer, was not sent into the field until the 1st of October, 1883, as it was deemed better to wait, and take advantage of the very lowest stage of water that could be found, not only as a matter of economy, but as affording the advantage of obtaining the fullest information when the rivers were in their worst condition, upon which state it was necessary to base the proper plan of improvement.

The survey was commenced at big Dam No. 1 on the Desplaines river, at Joliet, and continued to a point on the Illinois river near La Salle, where the Illinois and Michigan Canal enters the pool created by the lock and dam constructed by the state at Henry.

The rivers have an average width of about 600 feet, with banks from 8 to 23 feet in height above low water, so that within ordinary stages the stream flows within fixed banks. The oscillation between high and low water is about 15 feet, though a height of 23 feet has been recorded, occasioned by an ice gorge.

The fall in the low water surface between the points indicated above, a distance of 64.2 miles, is 100.25 feet. This fall is not, however, equally distributed over the entire distance, but occurs at various points, principally at the ripples, separating the different pools, and amounting in some cases to ten feet per mile.

It is evident, after consideration, that the only feasible plan to render the stream navigable is to slack water the entire distance. This can be accomplished by a construction of nine locks and dams, the cost of which depends upon whether the plan adopted shall be in conformity with that now in course of execution for the lower Illinois river, or whether the locks shall be of the size recommended for the Hennepin Canal. In addition to the requisite locks and dams, the plan also



contemplates the construction of a short canal at the falls of Joliet, and one at Marseilles. The location of the various structures and the two canals, were fixed upon, so that there should be no conflict between the United States and persons owning valuable manufacturing interests along the river, where water power is used."

Attached is the report of Mr. George Y. Wisner, assistant engineer, referred to in the document last read, signed in that name, addressed to Major W. H. H. Benyaurd, Corps of Engineers, headed:

"Report of Mr. George Y. Wisner, Assistant Engineer:

Chicago, Ill., February 22, 1884.

3774 Major: I have the honor to make the following report on the survey of the Desplaines and Illinois rivers from Joliet to La Salle, Ill., and to submit estimates of cost for improvement of the rivers by locks and dams, so as to give a minimum depth of 7 feet at low-water stages."

\* \* \* \* \*

"The survey was commenced at Dam No. 1, on the Desplaines river, at Joliet, and continued to the mouth of the Illinois and Michigan Canal, on the Illinois river, at La Salle.

The fall of the low water surface from above Dam No. 1, to La Salle, a distance of 64.2 miles was found to be 100.25 feet. The greater portion of this fall, however, occurs in less than half the above distance, at the ripples separating the various pools, and which in some cases amount to 10 feet per mile.

The river for the entire distance flows either over a rock bed or a strata of earth of only a few feet thickness, overlying the rock formation.

With one exception, at Treat's Island, all the locks and dams may be established on rock foundations.

\* \* \* \* \*

3775 It will also be seen from the accompanying maps that the river below the Adams dam is shallow, with channel obstructed with numerous small islands, and if improved by raising water surface by a dam at the head of Lake Joliet, the pool thus formed would, in all probability, soon fill up with deposits from the Illinois and Michigan

Canal, so that a navigable way could only be maintained by continual dredging.

Lake Joliet, however, is 5 miles long and 10 feet to 20 feet deep, and consequently, by commencing slack-water improvement at the head of this pool there will be little or no liability of the navigable channel becoming obstructed by deposits.

At the lower end of this pool Treat's Island, 4,500 feet long, is situated, past which the low-water plane of the river has a slope of 10 feet to the mile.

At the lower end of Treat's Island (6.3 miles below canal) Lock No. 3 is located, having a lift of 9.9 feet, and dam 350 feet in length. This lock will probably have to be built on a timber foundation. No borings were made, but the strata of sand and gravel overlying the rock formation probably does not exceed 12 feet in thickness.

Below Lock No. 3 a pool from four feet to 15 feet deep extends down to the mouth of the DuPage river (2 miles), below which is a ripple three-quarters of a mile long, having a low water slope of two feet per mile.

From this point the river is from 10 feet to 20 feet deep to within a short distance of the mouth of the Kankakee (three miles), the junction of which with the Desplaines forms the Illinois. At the mouth of the Kankakee the river flows over a rock bed, and for a distance of 1.7 miles has a low water slope of 4.4 feet per mile.

Lock No. 4 is located at the lower end of this ripple, having a lift of 8.8 feet, and dam 650 feet long."

**COUNSEL FOR DEFENDANT.** That is the site of the dam now under consideration in this case, and is the site of one of the supposed dams in this report.

There was also read in evidence on behalf of the defendant from "Sanitary District of Chicago. A concise report on its organization, resources, constructive work, methods and progress." "September, 1903. Prepared by the Chief Engineer," the preface being signed "I. R."

**COUNSEL FOR DEFENDANT.** There cannot be any question about who the Chief Engineer was. A list of officers is published on one of the pages, and it shows that Isham Randolph is the Chief Engineer.

There was read from said report, on page 12, as follows:

3778 "The Desplaines Valley is traversed by the river from which it takes its name—a stream of wide fluctuations with no constant and reliable fountain supply. During some seasons its whole discharge would pass through a six-inch pipe, and at others its volume reaches 800,000 cubic feet a minute. Then it rolls majestically along, flooding the whole valley. Such being the situation, control of this stream was a condition precedent to the successful prosecution of the work upon the Main Channel."

3779 There was also offered in evidence on behalf of the defendant, page 8, executive Document No. 264, House of Representatives, immediately following the list of all steamboats of more than 50 tons register navigating the Mississippi river, etc., as supplementing and as a part of the exhibit previously offered by the complainant of pages 6, 7 and 8 of said report, and which is as follows:

"The act of Congress in question, requiring plans and estimates for a channel at least 14 feet deep and at least 160 feet in width, has been complied with, and estimates on this basis are also submitted. This channel will accommodate, of course, with greater facility, large vessels that can reach its terminus at La Salle through the channel of the Mississippi river, at present about four and one-half feet in depth at low water, to be increased if practicable to 8 feet at low water below St. Louis, and to 6 feet on the Upper Mississippi and through the lower Illinois river, at present from 16 to 18 inches in depth on the unimproved section, to be ultimately seven feet deep at extreme low water, with locks 350 feet in length and 75 feet in width of lock chamber. No vessels now existing on the Mississippi river that cannot be accommodated by the 8 feet deep channel at extreme low water will be accommodated by the 14-foot channel 160 feet wide, but every increase in depth up to a certain limit of a navigable waterway increases the facility with which it can be navigated by large vessels; a channel from 14 feet in depth at extreme low water in Lake Michigan to 18 feet at high water across the Chicago divide; can be navigated by similar large boats if still water, or with a very moderate current, with greater facility and ease

than a still-water channel from 8 to 12 feet in depth. This is the best argument for such a channel, based upon the present or probable future navigation of the Mississippi river and its tributaries; it is not a public necessity.

As for the practicability of such a channel under the condition imposed by the act that it shall occupy the bed of the Illinois and Desplaines rivers, more will be said hereafter in this report.

Artificial waterways connecting superior navigations, even, are generally restricted and obstructive, and limited by motives of economy to the least dimensions that will accommodate the vessels that will probably seek their use. For this reason, probably, no channel has been recommended by any engineer under governmental or state authority, exceeding 8 feet in depth across the Chicago divide.

The strongest presentation of the necessity for a minimum channel 14 feet in depth from Lake Michigan to the Mississippi river, at the mouth of the Illinois river, is given by the chief engineer, of the Chicago Sanitary District, lately organized under the act of the Illinois legislature, approved May 29, 1889, entitled 'An act to create Sanitary districts and to remove obstructions in the Desplaines and Illinois rivers,' in an article published in the Chicago Tribune dated January 29, 1890. It is given here because the author represents the only interests demanding a large channel, and presumably offers the most cogent arguments available for governmental action.

Criticising the statements contained in the annual report of the Chief of Engineers for 1889, page 2130, *et seq.*, he says:

(The italics are mine, not appearing in the article in question.)"

- 3782 "The government is now engaged upon an improvement which will *secure* 10 feet at all stages below Cairo and 8 feet from St. Louis to Cairo. Certainly *if* it secures 10 feet to Cairo, this will extend to St. Louis, as suggested by the Mississippi River Commission. We may be sure that this minimum depth will *sometime* be obtained to St. Louis, and that *when it is*, the ordinary

boating stage will be as much in excess as now, or not less than 14 feet to St. Louis."

"If these depths were maintained, no one questions that the utility of greater depth would be apparent and would be undertaken. \* \* \*

If, however, a minimum depth of 10 feet is to be secured to St. Louis, it is *certainly practicable* to carry it over the same river, precisely to the mouth of the Missouri, 16 miles above, and then *only 24 miles intervenes to the mouth of the Illinois*.

No one will contend that this depth cannot be had over this 24 miles, if there is any wise purpose to be subserved, as there would be.

And here the gentleman leaps to Lake Michigan, seeking the mother of invention to help him over that 24 miles, and begs the entire question before he can get further with his 10-foot improvement.

If we can carry fourteen foot from Lake Michigan to the Mississippi.

If the government can improve 1,000 miles of river below St. Louis, we need not be balked by 40 miles above to the mouth of the Illinois.

If the improvement below St. Louis is made on the basis of 8 feet.

It is progressing slowly and laboriously on the basis of eight feet, *then*, we need 14 feet from the Illinois to Lake Michigan to meet that work, because the lower water stage on the Illinois is long continued.

He does not say how it is with the low water on the Upper Mississippi, subject to nearly the same climatic conditions, and we would only have a canal and slack-water navigation subject to an oscillation of from four to 20 or more feet, from Chicago to La Salle, with little variation in depth.

The significance of the '*ifs*' and '*whens*' may be made apparent in part by stating that the first '*if*' presupposes the expenditure as originally estimated by the Mississippi River Commission of not less than \$33,000,000 to secure 10 feet minimum depth below Cairo, which estimate has not been repeated in later reports, and might probably be modified by their experience. Whether the Government will '*secure*' 10 feet below Cairo is yet problematical. The Mississippi River Com-

mission have satisfactory reasons for reporting that they have solved the question of the possibility of obtaining that depth, but its realization is distant. The possibility of *securing* that depth is not so clear. No one knows how many years or centuries of time, or dollars it will require, under appropriations irregularly made, to obtain the depth of 10 feet, or to maintain or secure the depth after obtaining it.

No estimate has yet been made of the cost of fulfilling the requirements of the second, 'if,' *i. e.*, to 'secure' ten feet minimum depth to St. Louis; \$17,000,000, approximately total expenditure, is estimated to get 8 feet from St. Louis to Cairo. The consummation of this 8-foot project is not yet in sight, though favorably progressing. What it will cost to get and 'secure' or even maintain by continued labor the additional two feet in that region of moving sands no one knows.

The same remarks apply to the third 'if' in the progress towards the mouth of the Illinois. No estimates have been made to carry 10 feet to the mouth of the Missouri, nor to the mouth of the Illinois, nor 14 feet of the Illinois to La Salle, but for 14 feet from La Salle to Lake Michigan an estimate is herewith of more than \$48,000,000.

The definite estimates, then, so far submitted foot up nearly \$100,000,000 and leave us, granting estimates correct and the work done and 'secured' at St. Louis with 8 feet minimum draught below the city, and not exceeding 5 feet minimum depth above La Salle.

It is evident, therefore, accepting the gentleman's conclusions which do not necessarily follow, even from his hypotheses, that the necessity for the 14-foot channel is not urgent, and as far as navigation is concerned can wait, pending further consideration, without injury to public interests. All mechanical constructions would decay, if built now, before their full use would be available, awaiting the realization of the conditions expressed by the 'ifs' and 'whens' if built of the stone accessible to this line.

He concludes his argument—

No one in Chicago or in the Illinois Valley is interested in a 7-foot navigation. That is passing away after the stagecoach and plank road.

Eight feet minimum is proposed across Chicago divide, rising to from 10 to 12 feet across the divide, and to 20 feet in the rivers, with the oscillation of lakes and rivers. Less than 7 feet navigation exists on the Mississippi river to-day, and upon all its branches and navigable tributaries, and upon every non-tidal river, probably on the globe, not slack-watered or canalized around obstructions, and on nearly every canal on the globe not connecting tidal or deep waters.

All commerce by means of non-tidal waters (excluding inland lakes and seas) of the world, except an insignificant percentage, is effected on boats and barges of 7 feet or less draught of water, and interest in a 7-foot navigation will cease in Chicago when the Erie canal no longer exists, and generally when all rivers and canals, as well as men, are thoroughly regenerated."

There was also read in evidence from the report of the War Department, 1900, Chief of Engineers, Part V. Title page "Annual Reports of the War Department for the fiscal year ending June 30, 1900. Report of the Chief of Engineers. Part V, from the report of the Board of Engineers, signed "J. W. Barlow, Colonel, Corps of Engineers, etc., a report on the survey of the Upper Illinois and Lower Desplaines, beginning on page 3857, as follows:

3787 "General: The Board of Engineers, officers, constituted by paragraph I special orders No. 14, headquarters Corps of Engineers, U. S. A., March 12, 1899, to make a survey and estimate of cost for the improvement of the Upper Illinois river and Lower Desplaines river, with a view to the extension of navigation from the Illinois river to Lake Michigan at or near Chicago, met at the United States Engineer office, Chicago, Illinois, April 10 and 11, 1899."

Also from page 3859:

"If the route by the Chicago river and Drainage Canal be adopted, there remains but little more than half of the work involved in the eight-foot project of 1890, for the Government now to take in hand in order to complete the improvement, since the estimated cost of this portion of the channel (about 28 miles) was nearly \$14,000,000. By the Calumet and Sag route only about 10½ miles of the Drainage Canal can be utilized.

But while the Drainage Canal covers about half of the



work involved in the project by way of Chicago river, it at the same time has turned an additional flow into the Desplaines river, materially changing its low-water regimen. The requirements of this flow at present are 5,000 cubic feet per second, while the limit of ten thousand is probably more nearly the flow that will have to be dealt with, at least not long after the completion of the present project. As nearly as can be estimated, this flow gives a water line indicated upon the accompanying profile and the contrast is shown with the low-water conditions hitherto existing. The steep slope shown on the profile indicates that with so large a volume of discharge the velocity of the current would be too great for up-stream navigation in an open river. This might be overcome to a great extent by canalizing the river by high dams entailing great expenditures for the necessary works, as well as for the purchase of lands overflowed, the cost of which cannot even be approximated from present information."

Also at the foot of the page, the last paragraph:

"At the Marseilles Rapids, a canal about 7.4 miles in length is required to overcome the steep slope there encountered, and it is proposed to make the section not less than 160 feet wide at bottom, and ten feet deep in order to correspond to an eight-foot navigation in the river channel at low water. \* \* \*

The Marseilles Canal, beginning at the head of the Utica reach, will have two locks, each with a lift of 15 feet at an estimated cost of \$460,000; a guard lock and a dam at the head, estimated at \$300,000, and 7.4 miles of canal, estimated at \$1,052,500. From the head of the canal the route will follow the channel of the river to a point below and near the mouth of the Kankakee. Similar conditions with respect to depth and velocity of current will be met in this stretch as in that between Utica and Marseilles, and an estimate for both excavation and bank revetment is provided. From the head of this section a canal is necessary to reach the Joliet Basin, with locks to overcome a fall of 54 feet at low water in a distance of 17 miles, provision also being necessary for fluctuations of level at the upper lock. The estimates of the board are based upon overcoming this difference of elevation by fire locks, but further study may result in a reduction of the number."

There was also read from the volume "Book of Reports of the War Department, 1901. Chief of Engineers, Part 4," the title page being "Annual Reports of the War Department for the Fiscal year ending June 30, 1901. Report of Chief of Engineers, Part 4"—and from the same the report of Major Willard and Col. Barlow and Major Townsend, to Brig. Gen. John M. Wilson, dated November 18, 1900, the opening sentence reading:

3790

"Chicago, Ill., November 18, 1900.

General:

The River and Harbor Act approved June 6, 1900, provides:

That the Board of three engineers appointed by the Secretary of War, in pursuance of a paragraph in the river and harbor act approved March 3, 1899, to make a survey and estimates of cost of the improvement on the Upper Illinois river and the Lower Desplaines river in Illinois, with a view to the extension of navigation on from the Illinois river to Lake Michigan at or near the City of Chicago, is hereby authorized to report," etc.

Also from page 3061, there was read as follows:

"While the Upper Illinois and Desplaines rivers are at present non-navigable, the commerce of the Illinois and Michigan Canal, which has been constructed in the valleys of these rivers may be taken to represent the present commerce of such a route. The tonnage carried on the Illinois and Michigan Canal since 1860, derived from the reports of the Board of Trade of Chicago, is also appended."

Also, from the same volume, there was read in evidence a report of the Board of Engineers, page 3,049, signed by Barlow, Willard and Townsend, and addressed to John M. Wilson, Chief of Engineers, dated November 17, 1900, beginning:

"General:—The Board of Engineer Officers constituted \* \* \* to make 'a survey and estimates of cost for the improvement of the Upper Illinois river and Lower Desplaines river, in Illinois, with a view to the extension of navigation from the Illinois river to Lake Michigan, at or near Chicago,' " as follows:

Page 3050:

3791

"The Board finds the most economic route for waterways of seven feet and eight feet depth to be from Utica to Marseilles in the bed of the river, 11.4 miles; then

around the Marseilles Rapids by canal, 7.4 miles; thence in the bed of the river to near the mouth of Kankakee river, 21.2 miles; thence by enlarging the Illinois and Michigan Canal to the Joliet Basin, 18.3 miles; thence by canal through Joliet Basin and along the east bank of the Desplaines river,  $4\frac{1}{2}$  miles, connected with the Sanitary Canal at Lockport, and thence through the Sanitary Canal and the Chicago river to Lake Michigan, thus complying with the terms of the act of March 3, 1899."

There was also read from House Document No. 263, heretofore referred to by counsel for the complainants, as follows:

Page 7 (for the purpose of identifying a party hereafter to be a witness for the defendant):

"For details of the methods employed and the results accomplished in the actual work of the survey, attention is invited to the report of Assistant Engineer J. W. Woerman, which is hereto appended."

3792 On page 9, "Chicago Drainage Canal" there was read: "Besides being a highway of commerce the Illinois and Michigan Canal has from the beginning served to carry off the sewage of Chicago. The Chicago river has always been the main receptacle of the sewage of the city, and as the volume of sewage has increased with the growth of the city additional facilities for discharging it into the canal have become necessary. When the canal was opened in 1848 a pumping plant was established at Bridgeport where it joins the Chicago river. In 1860 the capacity of this plant was nearly doubled, being increased to about 400 cubic feet per second. Later on the summit level of the canal was cut down so as to provide a continuous gravity flow from the Chicago river and Lake Michigan. That work was completed in 1871 and the pumping plant abandoned. In 1883 a new pumping plant was brought into use, having a nominal capacity of 750 cubic feet per second, but it soon became evident that the discharge capacity of the old canal was quite inadequate to carry the volume of water required to dilute the sewage, and that a new and greatly enlarged channel must be provided. The Chicago Drainage Canal was then constructed and was brought into use in January, 1900. It has not yet been completed to its full capacity as designed. When fully completed, it will have

a capacity of 10,000 cubic feet per second, flowing at a low velocity."

Also, on page 12, under the head "Vested Rights."

"The steep slope of the Desplaines river and of the Illinois river above Utica is favorable to the development of water power. Rights of this nature have acquired additional importance with the recent increase in the discharge of the Drainage Canal, and will acquire still further importance with the further increase contemplated. An important water power has been developed by the State of Illinois at Joliet, and is now in use under lease by a private corporation. The Sanitary District of Chicago is engaged in the construction of works for the development of water power just above Joliet, an important water power is in use also at Marseilles.

3794 Various other schemes for the development of water power have been projected. In all such cases fixed dams with their resultant back flowage are a necessity. In fixing the location and height of its dams, the board has endeavored to avoid the injury of any of these schemes. It has succeeded in doing this for all that are developed, and probably also for those that are undeveloped. It has accepted the levels of the pools at and above Joliet as fixed by the dam now in existence at the former and and that under construction at the latter; and at Marseilles the canal around the rapids has enabled it to avoid the power dam at that place entirely. At other places economy in excavation and avoidance of overflow have been the guiding considerations. The best development of water power would no doubt, in some cases, call for a different arrangement. Fewer dams and those of a greater height and of the fixed type might, from that point of view, be desirable.

The plan submitted is not designed to develop water power; but there will probably be no difficulty in modifying it so as to conform to such development, if those who are to benefit thereby will co-operate with the government. They should pay the cost of the dams and the damages from flowage which is no more than they would be compelled to do if the Government made no improvement."

3987 There was also offered in evidence on behalf of the  
defendant from the Senate Journal of Illinois, for 1836  
and 1837, from the documentary history of the Illinois and  
Michigan Canal the following (pp. 273, 274):

3988 "Monday, January 23, 1837.

Mr. Thomas, from committee on canals and canal  
lands, reported following facts in relation to subject-  
matter of the bill:

Five persons were appointed a Board of Commission-  
ers, to adopt measures requisite to effect communica-  
tion by canal and locks between the navigable waters of  
the Illinois river and Lake Michigan, and were author-  
ized to employ an engineer and such other persons as  
might be necessary to discharge the duties imposed upon  
them.

They were also authorized to cause that part of the  
territory of the state which may lie upon or contiguous  
to the probable courses and ranges of said canal, to be  
explored and examined for the purpose of fixing and de-  
termining the most eligible and proper route for the  
same; and to cause all necessary surveys and levels to  
be taken, and accurate maps filed, and books and drafts  
thereof to be made.

They were also required to make a report to the next  
session of the general assembly, or to an extra session:  
Provided, the governor should commence the same under  
the power here granted.

The board employed Justus Post and Rene Paul as en-  
gineers, who made an experimental survey and estimates  
of cost, etc.

Post was paid for his services; Paul was not. The  
question is now presented—shall he be paid?

The fact that he was employed and devoted his time to  
the service of the state, appears from the report of the  
Canal Commissioners made to the General Assembly in  
1825.

The time of his employment has been proven to be  
120 days—the amount claimed is \$4.00 per day. To the  
committee, the question is plain that the claim ought to  
be allowed."

COUNSEL FOR COMPLAINANT. The balance of that report  
would occupy a page and a half. I ask that the whole report  
go in with the letter. It is simply the letter of Thomas

(chairman of the committee on canals of the senate) and the reply of Bucklin, and the committee's report.

COUNSEL FOR DEFENDANT. The part that I read from is page 136, part of the proceedings, part of the report of the committee on canal and canal lands, which was reported to the Governor (Report of Canal Commissioners of Illinois to Governor John R. Tanner of December 1, 1900), transmitting annual reports made on the 25th of February, 1837 (reading):

Page 137:

3992 "The magnitude of the work and the difficulties attending its execution have been long known and considered. The representatives of the people did not engage in the work without due consideration of those difficulties. The interest which the nation has taken in the project is evidenced by the act of congress changing the northern boundary line of the state by the purchase from the Indians of a strip of territory extending from the Illinois to the lake, with an eye single to this project, by the act of congress granting right of way to the state, and by the subsequent act granting lands of value sufficient to defray the whole cost of the work."

Also:

3993 "The surface of the canal as at present proposed to be constructed, is 60 feet, and bears the proportion of one and one-half to one to the surface of the canal as at first proposed. The depth of water is now six feet, whereas it was formerly four feet, consequently, the pressure of water being as the squares of the heights, and the leakage nearly as the square roots of the heights, the pressure will be more than doubled, and the leakage (taking into calculation the great surface), increased in proportion to one and a half to one. The quantity of water then that will be required to supply the evaporation and leakage in a canal of the dimensions proposed, will be 150 cubic feet per minute per mile; and with reference to the peculiar character of the country through which the canal passes. I know of nothing which would justify a departure from the established rule, in regulating the supply of water. It is true, the upper level is situated in a very wet country, but the levels below dependent upon the summit for water, are located on ground very badly calculated to retain it, and it is possible that more than the ordinary supply may be required.

If the project of supplying the canal from Lake Michigan be abandoned, and the high levels resorted to, the length of canal including feeders, to be supplied with water on the upper level is 56 miles, which will require 8,407 cubic feet per minute to supply the evaporation and leakage, and a further supply of 2,112 for lockage, making in all a minimum supply of 10,512 cubic feet per minute.

Very respectfully,  
Your obedient servant,

J. M. BUCKLIN."

- 3995 "Aside from the fact that according to the most authentic information, the Calamic and Desplaines do not afford sufficient water for the use of the canal, it is an admitted fact that the Calamic takes its rise in Indiana. From the latest maps it appears to bend through the corner of Illinois and pass into the lake near the state line. It is contended by some that it formerly passed into the lake in Indiana; it is, however, certain that the State of Indiana may use the water of the river to the exclusion of Illinois. The committee are not advised of any improvement projected by the State of Indiana requiring the use of the river. But the testimony of Lieutenant Burnett herewith submitted, although not conclusive, tends strongly to prove that a company, incorporated by the State of Indiana have projected a canal, which will require the use of at least a half of the water of that stream.

Upon the point now under consideration, the committee have arrived at the following conclusions:

First, that the Calamic and Desplaines do not afford sufficient water for the use of the canal.

Second. That if they did, it would not be prudent or safe to rely upon the Calamic.

In arriving at these conclusions, the committee have relied upon the evidence referred to, consisting of extracts from reports and other authentic documents. It must be evident to all those who have given the subject any examination, that the point on the Calamic where it is proposed to take the water, is below the summit of the canal line, and only 2 feet 81-100 above the level of the lake. The erection of a dam across the Calamic would, therefore, be absolutely necessary, the effects and consequences of which cannot with certainty be



calculated or ascertained. One effect would doubtless be the overflowing of an immense tract of country and a subsequent loss of water by evaporation, absorption, etc.

Your committee will now proceed to the examination of the second and third reasons assigned why a change should be made in the summit division of the canal, viz.: the length of time required and the difficulty and cost of construction. These are reasons which have often been urged and acted upon by those who have opposed to the policy of the state's undertaking so stupendous a work; but the judgment of the people has long since been pronounced against their sufficiency. Your committee will not pretend but that there are many difficulties to be encountered in the prosecution of the work, and that from five to eight years may be required for its completion. Having arrived at the same conclusion with all others who have examined the subject (except the committee of the house) that in order to construct such a canal as the nation has a right to expect, the waters of the lake must be used. The question naturally recurs, shall the state persevere in the work, or shall the project be abandoned? These are the real questions to be considered in answering the reasons assigned for the proposed change; and as these questions are general and applicable to the whole line of the work, their consideration will be deferred until the second proposition, for a change is considered and disposed of.

The second reason urged, viz.: that the cost of the improvement will be greatly diminished, will not be controverted, but of the value of that improvement compared with the value of the canal and the comparative advantages of the two descriptions of improvements, have not been discussed in the report.

It is a work national in its character, and the people of Illinois should rejoice at the opportunity offered of being instrumental in executing a work of such vast magnitude and importance. The eyes of the civilized world are resting upon us with intense interest, for our success in a work which promises such extensive and incalculable advantages to these United States. The people of the United States are looking to the completion of this work, as forming the last link in an endless chain which shall

forever hold these United States in the bonds and pledges of Union, and your committee ask in the name of the civilized world, in the name of the people of the United States, and in the name of Illinois, that no local, sectional or private interest be consulted in the decision about to be made.

The magnitude of the work, and the difficulties attending its execution have long been known and considered. The representatives of the people did not engage in the work without due consideration of those difficulties. The interest which the nation has taken in this project is evidenced by the Act of Congress changing the northern boundary line of the state by purchase from the Indians of a strip of territory extending from the Illinois to the lake with an eye single to this project, by the Act of Congress granting right of way to the state, and by the subsequent act granting land of value sufficient to defray the whole cost of the work. It has always been regarded as a national work, and the nation having furnished the means for its execution, have a right to expect that the work shall be projected and executed in a manner suited to the character and views of an united and enlightened people. The fund for this purpose is admitted on all hands to be ample, and no citizen of Illinois ought to be willing to see the faith of the state violated, public expectation disappointed and the beneficence of the national government abused by authorizing any other description of work.

The question may be confidently asked—why should anyone desire to disappoint the hopes and expectations of the nation in regard to the character of this work? Can it be supposed that the nation would have extended assistance by so large and extensive a grant of lands toward the execution of a project purely local, a project which at best would not accommodate the trade of Illinois alone five years hence.

To engage in such a project would be sporting with the bounty of the nation and degrading to the character of the state. Who among us would be willing to stand forth before an enlightened, liberal and magnanimous nation, and proclaim the sentiment; the nation has furnished us with means to execute a great national work, and although by accepting those means, we stand pledged to use them for the purpose intended, yet as the work

of a totally different and greatly inferior character, can be executed for one-half the amount furnished, we will make such a work and vest the other half of those means in bank stock or in improvements of a character purely local. If there be among us any who would be willing to assume such an attitude, and in the face of the world proclaim such a sentiment, it is to be hoped, for the honor of the people and dignity of the state, none such can be found in the walls of the legislature. Such a sentiment strikes at the very foundation of the public faith, and if acted upon would lead a total subversion and overthrow of our free institutions. The proposition is too monstrous and involves consequences too disastrous to be entertained for a moment; and your committee will not act upon the presumption, nor indulge the idea that any citizen of Illinois will ever be found giving countenance to such a sentiment.

Your committee are satisfied that the canal lands will defray all expenditures required in the construction of the canal, upon the enlarged plan proposed by the Canal Commissioners, and they hope to see the time when its navigation will be made free to all the people of these United States.

There should be no question asked in regard to a supply of water from any other source than the lake, so long as it is known that the means furnished by the nation are simply sufficient to execute the work. In the completion of such a project, computations of time should be made with reference to the existence of the union, and not with reference to the growth of a village. If, contrary to all calculations, eight or fifteen years shall be required for its completion, this would not justify the state or the people in a violation of their plighted faith. The time is not distant when Illinois must stand at the head and in the front of all the western states, and when that time shall arrive, that nothing could be a source of greater mortification to her citizens or her sisters, than a knowledge that in her infancy, she had been guilty of a violation of public faith.

Your committee are of the opinion that a lateral canal connecting the waters of the Illinois and Michigan Canal with the waters of the Calamie, is practicable, and will probably be required at some future time. Before any expenditure of money is authorized for that purpose,

the consent of the State of Indiana should be obtained to the use of the water of that stream, and an agreement irrevocable, except by the consent of both states, should be entered into, fixing the terms upon which the water may be used, and the terms upon which the citizens of Illinois shall be allowed to navigate said river.

Your committee highly approve the decision of the commissioners fixing the size and dimensions of the canal, and they cannot but remark, that nothing but the greatest industry and attention to their duties could have enabled the commissioners to have made such progress in the prosecution of the work.

It appears from the report of the commissioners that no addition will be required to the canal fund during the present year, but that provision must be made for the year 1838. For this purpose, it is proposed to sell alternate lots in the town at the termination of the canal, and other towns along the line, to the amount of \$1,000,000, and to authorize a further loan of \$500,000 in the event of that amount being required.

In the present state of things it is deemed bad policy to bring into market any of the canal lands. It is believed that under the provisions of an Act passed during the present session, those lands can be protected against all further depredations. To carry out the views of the committee, they report a bill, and recommend its passage."

4003 Also, on page 210:

"Previous to 1816 the United Tribes of Indians known as Ottawas, Chippewas and Pottawatomies, claimed all the land between Chicago and the mouth of the Fox River. In order to secure undisputed possession of the river between these two points, a treaty was arranged between these tribes and Ninian Edwards, William Clark and August Chonteau, commissioners plenipotentiary of the United States; this treaty was consummated the 24th day of August, 1816, and was signed by the above named commissioners and F. Assikinock, otherwise known as Black Partridge, chief of the United Tribes. The object in securing this strip was to construct a military road to facilitate the building of the proposed ship canal."

Also, on the preceding page, from Woodruff's History of Will County:

"The project of a ship canal to connect the waters of Lake Michigan with the navigable waters of the Illinois River was first suggested during the war of 1812, by some writer in the Niles Register in 1816. The title to a strip 20 miles wide was obtained of the Indians with a view to such work."

Also, from page 269 of the report of E. W. Willard, land agent, in the same volume, referring to the Indian question, there was read as follows:

4006 "In the various histories of Illinois there has been little said of the Illinois and Michigan Canal. The work was national in its character and its progress was observed with intense interest throughout all the states. The interest which the general government had taken in the project is evidenced by the Act of Congress changing the northern boundary lines of the state, by purchasing from the Indians a strip of territory extending from the Illinois River to Lake Michigan—by the Act of Congress of 1822, granting the right of way to the state, and the act of 1827 granting land to defray the cost of construction."

4007 Pages 204 and 205 from the report of William Gooding, chief engineer of the canal, dated canal office, Lockport, December 15, 1842, showing gauge readings, introduced in evidence.

The report shows "Gauges of Calumet River by U. S. engineers—17,281 per minute. By Bucklin, 5,333 per minute.

S. Desplaines river, Post & Paul, 1950, by Bucklin, 1,000 per min.

S. DuPage river, U. S. Engineers, 1665, by Bucklin 6916 per min.

The aggregate minimum discharge of the three rivers would be thus shown:

4008 Calumet 5,333, Desplaines 1,000, DuPage 1,655=7,998 cubic feet per minute. This quantity of water was to supply filtration and evaporation of 74 miles of canal, necessary lockage water and loss at dams and upon Calumet feeder. It is, therefore, obvious that there would have been barely a supply for a canal of ordinary dimensions, admitting that the water could have been introduced (as it might have been) at the points desired.

Quantity of water in all these streams continues to diminish till the 1st of November, when the total would be about 7,300 cubic feet per minute for all three rivers. The water necessary to supply the canal from Chicago to Marseilles is 9,924 cubic feet per minute, or a deficiency of 2,624 cubic feet per minute. There would be some loss at the dam at the Calumet, upon three or four miles of the feeder, and also at the DuPage dam. It would be safe to calculate, however, that there could be introduced into the canal from these three rivers 6,300 cubic feet per minute. The total supply needed is 9,924 or a deficiency of 3,624 cubic feet per minute.

The report states that the engineer's remark in relation to these gauges that the results are predicated upon the present stage of water, and that the quantities may sometimes be lower.

4012 The defendant here introduced certified copies of certain records of the Will County, Illinois Circuit Court, in the case of *James McKee v. The Board of Canal Commissioners of the Illinois & Michigan Canal*, the final order of said Circuit Court providing "that the said James McKee is entitled to damages for his land, mill site water and water privileges taken from him by the defendants for the construction of the Illinois and Michigan Canal; and the said Court do assess the damages of the said James McKee on occasion of the premises at the sum of seventeen thousand six hundred and fifty dollars upon his releasing to the commissioners the land taken." Deed of James McKee and Sally McKee, his wife, in conformity with the said decree.

4030 Certificate of recording of said deed.

4408 Thereupon counsel for defendant at request of counsel for complainant pursuant to stipulation heretofore agreed upon, read in evidence from page 40 of the report of 1890 (House Doc. No. 264. 51st Cong., 1st Sess., p. 40), in connection with the passage and read by counsel for defendant from said book and page:

4410 "Starting from Bridgeport, the Illinois and Michigan Canal was constructed in a straight line to the Desplaines Valley at Summit. As originally constructed, the canal had a summit level, a lock having been built at Bridgeport and one at one-half mile south of Romeo,

this summit level being supplied originally by the Calumet feeder.

The drainage area of the Chicago River is about 270 miles, and the natural dry weather flow practically nothing. The sewage of the city is discharged mainly to the river and it early became necessary to provide some means of getting rid of it other than permitting it to escape to the lake when the flow was sufficient to carry it there. For a while pumps were operated at Bridgeport which pumped the water and sewage into the summit level of the canal. Subsequently the city deepened the canal to six feet below low water of 1847 in Lake Michigan which is Chicago City datum. This gave only temporary relief. The low water surface of the Des-  
4411 plains River at Summit is eight feet above Chicago datum, and high water rises seven feet higher. The canal does not enter the bed of the river, except at one place where the river was diverted for the purpose, but run along the eastern bank of the river, the water of the river being prevented from coming into the canal by the spoil banks.

The material in which the canal was excavated varies from clay at Bridgeport to gravel and boulders at Willow Springs. The surface of the ground varies from eight to fourteen feet above Chicago datum. In many places under the headwater in the river and the drainage of the adjacent lands, the narrow deep cut was unable to maintain the slope of its sides, which are said to have been cut at the slope of one to one, and soon the canal became obstructed by the falling of its banks, and the flow was insufficient to carry off and properly dilute the sewage. The flow from the lake was also diminished by the water which came from the river through the permeable soil, and by the natural drainage on the east side of the canal.

Pumping works and a lock were then constructed at Bridgeport, and water pumped from the river into the canal. The lift of the rocks vary from one to three feet. The capacity of these pumps is said to be 1,000 cubic feet per second and the amount pumped is from about one-half to three-fourths that quantity. This produces a feeble current up the south branch from the north  
4412 branch, and the lake when the natural flow and sewage combined does not exceed the capacity of the pumps.



The south fork, however, is left in an indescribable condition of filth and offensiveness. The west fork originally did not extend beyond Kedzie avenue, but by that construction of ditches and other causes it may now be said to have its source in the Desplaines River near Summit. The upper part of its course is known as the Ogden ditch. The ground along the west fork is generally lower than along the canal, the low ground along part of its course being known as Mud Lake Valley. The Mud Lake Valley was originally separated from the Desplaines River by a low bank raised probably by the river itself. This bank was cut and the city has since been engaged in an effort to prevent the water of the Desplaines River coming down the west fork and carrying the sewage into the lake.

4413 A dam, known as the Ogden Dam, has been built near Summit across the Ogden ditch, where it leaves the Desplaines River, the crest being about 11 feet above city datum. The floods come over the dam, and over the adjacent banks, and flow out to the lake through the Chicago River, carrying with it accumulated sewage which the feeble current created by the pumps have not been able to remove. The canal drains the country south and east of it, and when the amount of storm water is large it overtops the lock gates at Bridgeport, which are then opened and the flood flows out to the lake through the river. The City of Chicago takes its water supply from Lake Michigan near the mouth of the Chicago river, and the purity of the water supply is threatened by the sewage carried into the lake. The city is now proposing to dig a large drainage canal along the Chicago route for the purpose of carrying its sewage down the Desplaines and Illinois rivers.

The proposed waterway between Bridgeport and Summit could follow the line of the present canal, the west fork and Ogden ditch, on a line intermediate between the two, but it is necessary to take into account the local conditions and to provide for preventing the waters of Desplaines river going to Lake Michigan through the Chicago or Calumet rivers carrying with them the sewage of the City of Chicago.

From Summit to Sag bridge the proposed route follows the valley of the Desplaines river, which is from one-half to three-fourths of a mile wide, entering the

bed of the river about three miles below Summit. The river from Summit to below Sag bridge varies greatly in width and depth. This portion of the river is known as the 12-mile level. The low water flow of the river above Summit is very small, and the maximum measured high water discharge about 10,000 cubic feet per second. At low water the entire flow passes in part through the Ogden ditch, but the greater portion into the canal through the permeable soil separating them."

Counsel for defendant then offered the report of the Canal Trustees, title page:

"Complete list of the lots and lands conveyed by the trustees of the Illinois and Michigan Canal, showing size of lots, appraisal sales, from September, 1848, to May, 1849, names of purchasers, etc., compiled by our Board, February 15, 1850, Chicago, printed at the Democrat office, 45 La Salle street, steam presses, 1850."

And on page 5, Roman letters, if it were paged; it is the first page after the table of contents, down to sales made by trustees, that would be the 5, Roman page, on down to sales made by trustees, on the sixth Roman page.

4479 Thereupon the court heard argument upon the admissibility of the portion of the book so offered.

COUNSEL FOR DEFENDANT. The first page refers to sections of the Act of 1843, and speaks of the conditions under which the trustees are to sell and convey the property. I also offer on page 7, Roman figures, "Chicago," for the purpose of showing that at the date of the publication of this book there was still considerable land in odd sections remaining unsold in the City of Chicago.

I will state that I expect to show further that a considerable number of these lots, were lots upon the Chicago river, and vicinity that were sold after 1839, and no reservation made, unless it be in the statute itself, of any part of the river bed itself.

COUNSEL FOR COMPLAINANT. I object to it as irrelevant, incompetent and immaterial.

Said portion of said document was received and read in evidence as follows:

4481

"CHICAGO:

The whole number of lots, and out-lots in Chicago and vicinity, prepared for sale by the trustees, was 1478;

and the valuation thereof \$627,528. Of these lots 998 have been sold; and there remain unsold 579; of which 230 are at present held for sale by injunction;—embracing now all unsold in blocks 4 and 7, original town, and section 1721 and 29 E. 39, R. 14, East.

In the immediate vicinity of the railroads, there is still unsold a large number of very eligible lots; and in the lower part of fractional section 15, quite a quantity equally desirable, so that it may be seen that the property in and about Chicago hereafter to be sold is of the most valuable and attractive character, whether it be wanted for occupational or permanent investment."

COUNSEL FOR DEFENDANT. Joliet, a similar paragraph on page 9, about this town of Joliet

"JOLIET:

About this town, the trustees prepared 456 lots for sale, which were appraised at \$10,885. Of this number 242 have been sold, leaving unsold 214, all of which are very well situated, and worth greatly more than the appraisal."

COUNSEL FOR COMPLAINANT. Objection that it is irrelevant, incompetent and immaterial.

Page 12:

"LANDS.

The Canal Lands, it is well known, include the odd, numbered sections embraced in a strip averaging about ten miles in width, lying on both sides of the canal, and extending from the commencement of Lake Michigan to its termination on the Illinois river; a distance of nearly 100 miles. They also include, as far as they continue, the rich valleys of the Desplaines and Illinois  
4483 rivers, and the heavy bodies of timbers along their borders. In point of location, health, fertility and adaptation to general farming purposes, these lands are certainly unsurpassed by any of the west.

Unlike most prairie districts, they are generally well supplied with timber and water; and throughout the westerly half, coal abounds in a characteristic quantity. Water power is likewise abundant, as well as lime and sandstone of good and useful quantity. All told, there are some 173,000 acres and in this quantity more than 30,000 acres is very good timber, which, for the ac-

commodation of farmers will hereafter be offered for sale in forties.

The land is situated in Cook, Will, Grundy and La Salle Counties, and occupies the central and more valuable parts.

Cook County contains much the largest population of any in the state, and Will and La Salle are among the most populous and wealthy, while Grundy, in agricultural resources, is inferior to none. Nowhere in the west has farming industry been better repaid, or business enterprise of every kind been more amply rewarded.

4484 The Illinois and Michigan Canal, passing nearly through the center of this tract of land, is one of the largest, most substantial, and splendid works of the age. It completes and furnishes the most important connecting link in the great circuit of the boundless inland commerce of our country. It has been in operation but two seasons, and its effect upon the value of produce and property, and all the leading branches of trade within its influence, has outrun all just expectations.

Its future bearing upon these great interests will only be limited by the horizon that marks the boundary of the enterprise, improvement and prosperity of the west, our country, and the world.

Looking, then at this property, in its true position, with all the numerous advantages attending it, as well as the superior character of the property itself, and the low price at which it will be sold, it is no assumption to assert, that no part of the country, at the present time, offers greater inducement to the farmer or business man of every description than does this district of land; and for the benefit of the canal fund, and the counties in which they are situated, the hope is, that they will not long remain unsold and unoccupied."

4485 Thereupon counsel for complainant again called the court's attention to the letters of Colonel Bixby and the Assistant Secretary of War, and urged the admission in evidence of said document which had been previously excluded. Whereupon, after extended argument, the court ruled as follows:

"The COURT. I will admit the evidence and reverse the ruling."

Said documents were received and read in evidence as follows:

“UNITED STATES ENGINEERING OFFICE,  
508 Federal Building,  
Chicago, Ill., March 27, 1906.

Brig. Gen. A. Mackenzie,  
Chief of Engineers, U. S. Army,  
Washington, D. C.

General:

1. In reply to Department letter (E. D. 58726) dated  
4486 March 16, 1905, as to the proposed plans of a water power company for a dam across the Desplaines river, Ill., just above its mouth, which have been verbally and informally presented to your office by the Hon. H. M. Snapp and the water-power representatives, I have herewith to submit report as follows:

2. The dam in question is that proposed by Chas. A. Munroe, of Chicago, Ill., as explained by his letter to this office under date of March 20, 1906, with enclosures (copies herewith—2 letters, 3 blueprints). (5 incls.)

3. The Desplaines river, so far as now known to this office, has never yet been considered a navigable stream of the United States. It is therefore apparently as yet subject to such jurisdiction as applies to all other unnavigable streams and not subject to the provisions of Section 9-13, Act of March 3, 1899, or to other similar U. S. legislation.

4. The agents of the water power company in question, informally claim to have secured possession of all the land on each bank of the river necessary to allow for construction of the dam and of its accessories, and to protect themselves from all future claims for overflowage created thereby, so far as any existing known rights are concerned; and they likewise claim that there is no existing state law, or United States law which prohibits their legally going ahead with their proposed  
4487 construction and that no special law is needed therefor. They admit, however, that in some minor matters, they still lack necessary authority from the local Board of Supervisors, to condemn certain properties which they still wish to acquire in order to facilitate or simplify their future work (such permission, however, not being absolutely essential to such work) and they state that the Board of Supervisors are willing to grant such author-

ity as soon as it is evident that the proposed power dam construction will not interfere with the future development of the river for navigation purposes.

4488 5. The water power company agents likewise state that their object in bringing the matter up before the War Department at present, is to make evident that the proposed dam construction not only does not conflict with any existing U. S. law but also will assist rather than injure the possible future navigation of the Des-plaines and Illinois rivers, should the improvement of such rivers ever be authorized by Congress in the manner proposed by the last Board Report of August 26, 1905, upon the feasibility and cost of a navigable waterway from Lockport, Ill., to St. Louis, Mo., via the Des-plaines, Illinois, and Mississippi rivers, (House Document No. 263, 59th Congress, 1st Session); and they desire to secure from the War Department some expression of opinion, informal or otherwise, so far as it can properly be given, that will allow them to assure all inquirers that the War Department so understands the situation, and is making no objection to such prompt progress of the work as is necessary to a business enterprise of its magnitude and importance.

6. Paragraph 17 of the Board Report of August 26, 1905, above referred to, specially stated that the plan submitted by the Board was 'not designed to develop water power, but there will probably be no difficulty in modifying it, so as to conform to such development if those who are to benefit thereby will co-operate with the Government. They should pay the cost of the dams, and the damage from flowage, which is no more than they would be compelled to do if the Government made no improvement.' The plans herewith submitted by Mr. Munroe show plainly a proposed co-operation such as that described in the above Board report, offered in such manner as not only to pay the cost of this power dam, and to protect the United States against flowage damage, but also to lessen by one the number of locks and dams necessary for future navigation and to otherwise save both time and money (\$142,385 in first cost, and \$4,000 annually thereafter for maintenance and operation) to the United States, in case Congress should finally decide to undertake the improvement covered by the August 26, 1905, Board report, or to otherwise make

this river navigable in this neighborhood. All information, so far received by this office, appears to substantiate the statements of Mr. Munroe, as described above; 4489 and I consider that his proposition should be encouraged and that he should receive from the War Department whatever expression of favorable consideration may be proper and allowable under such circumstances.

7. I have carefully considered the question of this power dam project and have talked it over at intervals with Mr. Woerman, while he was Assistant Engineer in local charge of the Illinois river survey under this office before he had been employed by Mr. Munroe, as well as since that time, and have discussed the matter also with Mr. Munroe; and I believe that the provisos of the next paragraph below are fair and advantageous to both sides, and will leave to the future only the question of regulating pool levels so as to avoid a conflict between depths of water needed for navigation and heads of water needed for power purposes, and so as to divide up the river water between the two according to such rights as may exist when the river shall become a navigable water (which it appears not to be at present), and when the United States shall decide to give up the use of the canal and to assume the improvement of the river. Until such time I do not see how the War Department can assume any definite jurisdiction of the Desplaines river or make any definite demands upon any water-power company already organized for the use of this river. It is my present understanding that these provisos will be accepted by Mr. Munroe.

4490 8. I have therefore to recommend that the Hon. H. M. Snapp and Mr. Charles A. Munroe be informed that the War Department will waive any and all objections which it may have to the progress of such water-power dam construction as proposed by Mr. Munroe's letter of March 20, 1906, and its inclosures, provided that he, on the part of the power dam owners, agrees.

(a) that he will construct and maintain in good repair, just above the mouth of the Desplaines river, in location as approximately shown on the blueprints, a dam and spillway sufficient to hold the water surface of its upper pool at a height equal to the present mean level of Lake Joliet (taken at 512.0 feet, Memphis datum); and later



whenever Congress shall have ordered the improvement of the Desplaines river for navigation purposes, will raise this dam 3.0 feet higher (giving pool level of 515.0 feet, Memphis datum) if the War Department shall so order; and will grant the United States the use of such pool so far as needed for navigation;

(b) that he will assume the cost of, and protect the United States from, claims for all flowage damages caused by this dam between its site and the north line of Section 11, Township 34, Range 9 East, which line is about 1.5 miles by river above the next higher lock and dam proposed by the Board report (*i. e.*, Lock No. 4 and Dam No. 2, at the foot of Treat's Island);

4491 (c) that he will grant to the United States a strip of land at least 150 feet wide across the north end of this dam, to be so located between it and the towpath of the present Illinois and Michigan Canal, as to connect the present mid river above, to the same below, in the manner approximately indicated on the accompanying blueprints; such strip to be used by the United States for the construction and maintenance of a boat lock, its necessary approaches, and other purposes of navigation;

(d) that he will do all the above, free of cost to the United States;

Provided, that the War Department will waive any and all objections which it may have to the progress of such water-power dam construction.

Very respectfully,

W. H. BIXBY,

*Lt. Col. Corps of Engineers."*

4492

"WAR DEPARTMENT.

Washington, June 7, 1906.

Sir—

In reply to your letter of June 5, 1906, addressed to the War Department, in the matter of the construction by yourself and associates of a dam and spillway across the Desplaines river near its mouth, at the location and as shown on maps submitted with your letter of March 20, 1906, addressed to Lieutenant Colonel W. H. Bixby, Corps of Engineers, U. S. Army, I have the honor to advise you as follows:

It is understood that yourself and associates are willing to comply with the following conditions, viz:

First. That the details of construction shall be such as to insure permanency and of sufficient capacity to hold the water surface of its upper pool at a height equal to the present mean level of Lake Joliet (taken at 512.0 feet Memphis datum); and later whenever Congress shall have ordered the improvement of the Des-  
4493 plains river for navigation purposes, the dam shall be raised by you and your associates 3.0 feet higher (giving pool level of 515.0 feet, Memphis datum), if the War Department shall so order; the United States and the public to have the free use of such pool so far as needed for navigation purposes, and the use of water for power purposes shall be so limited that the level of the pool shall at no time be reduced below that adopted for navigation in the plans of the United States for the slack-water improvement of the river.

Second. That the United States shall be protected from claims for all flowage damage caused by the dam between its site and the north line of section 11, township 34, range 9 east, which line is about 1.5 miles by river above the next higher lock and dam proposed by the Board of Engineers' report (*i. e.*, Lock No. 4 and Dam No. 2 at the foot of Treat's Island).

Third. That there shall be conveyed to the United States free of cost a strip of land at least 150 feet wide across the north end of this dam, to be so located, between it and the tow-path of the present Illinois and Michigan Canal, as to connect the present midriver above the same below in same manner approximately indicated on the accompanying blueprints; the right of the United States to enter upon and use such strip of land for the construction and maintenance of a boat lock, its necessary approaches, and for other purposes of navigation, if it so desires, without liability for damages resulting in any way from its operation in connection with construction or maintenance of said lock and appurtenant works to be duly guaranteed.

If these conditions are complied with, in the opinion of the Chief of Engineers, U. S. Army, concurred in by this department, the work proposed is in general har-  
4494 mony with the work of improvement recommended by the Board of Engineers appointed under authority of the River and Harbor Act of June 13, 1902 (32 Stat. L., 331, 364), in its report dated August 26, 1905, printed

as House Document No. 263, 59th Congress, first session.

Inasmuch, however, as Congress has not as yet authorized the improvement of this river, this department does not deem it expedient to take further and definite action in the matter of approving the plans.

Very respectfully,

ROBERT SHAW OLIVER,  
*Assistant Secretary of War.*

MR. CHARLES A. MUNROE,

The Rookery, Chicago, Illinois."

4495 Thereupon counsel for defendant read in evidence the deed from Thomas Ford, Governor of the State of Illinois, to the trustees, the trustees at that time being William H. Swift, David Leavitt and Jacob Fry, trustees of the Illinois and Michigan Canal.

Said deed was thereupon marked Snyder Exhibit 1, and is as follows:

4496 *To all to whom these presents shall come, I, Thomas Ford, Governor of the State of Illinois, send Greeting:*

*Whereas*, the General Assembly of the State of Illinois passed an act approved the twenty-first day of February, in the year of our Lord one thousand eight hundred and forty-three, entitled "An Act to provide for the completion of the Illinois and Michigan Canal and for the payment of the Canal debt 'Which said act, is in substance and effect as follows, viz:

*Whereas*, It has been represented, that certain holders of the bonds of this state are willing to advance the necessary funds for the completion of the Illinois and Michigan Canal, upon being secured the payment of their said advances, and of their said bonds, by a vested lien upon the said canal, lands and revenues; for the purpose, therefore, of accomplishing an object so desirable and beneficial to the said bondholders and the State:

SECTION 1. *Be it enacted by the people of the State of Illinois represented in the General Assembly. That, for the purpose of raising a fund for the completion of the Illinois and Michigan Canal the Governor of this State, be, and hereby is fully authorized and empowered to negotiate a loan solely on the credit and pledge*

4497 of the said Canal, its tolls, revenues and lands, to be granted to trustees, as hereinafter provided of one million six hundred thousand dollars, for a term not exceeding six years; and at a rate of interest not exceeding six per cent. per annum, payable out of the first moneys to be realized from the said canal, its land, tolls, and revenues; the payment of interest and reimbursement of principal to be at such place, within, or without the United States, and payable in such currency as may be agreed on.

Section 2. The holders of Canal bonds and other evidences of indebtedness of this State, issued for the purpose of aiding in construction of the Illinois and Michigan Canal, or hereafter to be issued for work done, percentage, scaleage, or damages, shall be first entitled to subscribe in proportion to the amount of bonds, or other indebtedness held by them, and take the whole of the said loan; but if within a reasonable time, to be determined by the Governor, any of the said holders of Canal bonds, or indebtedness, shall neglect or refuse to subscribe as aforesaid, the whole of the said loan may be subscribed for, and taken by other holders of canal bonds, or indebtedness; but if within a reasonable time, to be determined upon by the Governor, the holders of the said canal bonds or other evidences of indebtedness, aforesaid shall not subscribe for, and take the whole of the said loan, then, and in that case, any other person or persons, body politic or corporate, shall be entitled to subscribe for, and take so much of  
4498 the said loan as may remain unsubscribed for, by the said holders of bonds or other evidences of debt aforesaid.

Section 3. After the said loan shall be subscribed for, as aforesaid, there shall be appointed three discreet persons to constitute a Board, to be known by the style and description of the 'Board of Trustees of the Illinois and Michigan Canal,' one of the said trustees shall be appointed by the Governor of this State, and the other two shall be elected or appointed by the subscribers to the said loan, or the holders of the certificates authorized by this Act, in manner and form as hereinafter mentioned. Whenever any vacancy shall occur in the said Board of Trustees, either by death or resignation, or from any other cause, said vacancy shall be filled

by the Governor, or holders of said certificates, to whom belonged the appointment of the Trustees whose seat shall have become vacant, as the case may be.

4499 Section 4. The first election of Trustees by the subscribers to said loan, under this act, shall be held at the Canal office, at Lockport, at such time as the Governor of this State shall appoint, under the direction of one of the Judges of the Supreme Court of this State, who is hereby appointed inspector of the first election, and the two persons then elected as Trustees by the said subscribers, and the person appointed trustee by the Governor shall hold their offices for two years from the time of their said election or appointment, and until others are elected.

Section 5. Subsequent elections shall be held every two years, at such time and place, and under the directions of such persons as a majority of the Trustees, for the time being shall, by resolution to be entered on their minutes, appoint, and shall hold their offices for two years, and until others are elected in their stead.

Section 6. At the election of Trustees under this act, each stockholder shall be entitled to one vote for each and every one thousand dollars of stock held by him; and in all elections, votes may be given in person or by proxy.

Section 7. All elections shall be by ballot, and the two who shall have the greatest number of votes shall be the two Trustees duly elected by the said subscribers or holders of said certificates. At all such elections, the said subscribers or holders of said certificates, shall designate upon their ballots one of the persons voted for as President; and the person having the greatest number of votes as Trustee and president, shall be one of the said Trustees and President of said Board.

4500 Section 8. The said Board of Trustees of the Illinois and Michigan Canal, when duly appointed and elected, as aforesaid, shall apportion their respective duties among themselves, and so far as is not incompatible with this act, shall possess all the powers, and perform all the duties conferred upon the Board of Commissioners of the Illinois and Michigan Canal, by the act entitled 'An Act for the construction of the Illinois and Michigan Canal,' approved January ninth, eighteen hundred and thirty-six, and the acts supple-

mentary and amendatory thereto; and shall take an oath or affirmation, and give bonds, with security, for the faithful discharge of the duties imposed upon them by this act.

Section 9. If the holders of any of the said canal bonds, or other evidences of indebtedness issued for the purpose of aiding in the construction of the Illinois and Michigan Canal, shall become subscribers for the said loan, or any part thereof, they shall, at the time of subscribing, file or cause to be filed with the Governor, a brief description of said bonds or other evidences of indebtedness, aforesaid, owned by them; which description shall be deposited by the Governor in the office of Auditor of Public Accounts, in order that the evidences may be preserved to discriminate the holders who subscribed for the said loan, and to identify the said bonds, or other evidences of indebtedness, aforesaid, that may in consequence be entitled to a priority of payment out of property and assets granted to the Board of Trustees as hereinafter provided.

4501 Section 10. For the purpose of placing in the hands of Trustees full and ample security for the payment of said loan, authorized by this act, and the interest thereon, as well as for securing a preference in the payment of such of the canal bonds and other evidences of indebtedness issued by this State, for the purpose of aiding in the construction of the Illinois and Michigan Canal, as may be owned by the subscribers to the said loan, the State does hereby irrevocably grant to the said Board of Trustees of the Illinois and Michigan Canal, the bed of the said Illinois and Michigan Canal, and the land over which the same passes, including its banks, margins, towpaths, feeders, basins, right of way, locks, dams, water power, structures, stone excavated and stone and materials quarried, purchased, procured or collected for its construction, and all the property, right, title and interest, of the State, of, in and to, the said Canal, with all the hereditaments and appurtenances thereunto belonging or in anywise appertaining; and also all the remaining lands and lots belonging to the canal fund, or which hereafter may be given, granted, or donated by the General Government to the State, to aid in the construction of the said canal, and the buildings and erections belonging to the State thereon sit-

uated. The said Board of Trustees to have, hold, possess, and enjoy the same as fully and as absolutely, in all respects as the state now can, or hereafter could do, for the uses, purposes, and trusts hereinafter mentioned; but it is to be understood that all canal lands and lots heretofore sold by the Board of Commissioners upon which moneys are now due, or may hereafter become due, whether the said lands and lots be now forfeited or relinquished, or hereafter become forfeited or relinquished shall be exempt from the aforesaid provisions of this act; and the trustee herein provided to be appointed by the Governor, or any other officer, or officers having the management of the affairs of the canal, until said Trustee be appointed on the part of the State, is hereby authorized and required to settle all accounts due to contractors and others (except for such damages as are hereinafter provided for) by issuing certificates of indebtedness, which together with the certificates of Indebtedness Scrip and acceptances heretofore issued by the said Canal Commissioners shall be received by said trustee, or other officer or officers aforesaid in payment for said lots and lands whenever they may be presented for that purpose, the said lands and lots hereby reserved shall, within three months after the passage of this act, be appraised, as is provided in the thirteenth section of this act, and sold in accordance with the laws of this State negotiating the sale of Canal lands.

4503 Section 11: The subscribers to the said loan shall execute an agreement to, and with, the Governor of this State, to pay the amount by them respectively subscribed, to the said Board of Trustees, at such times and in such proportions as said Trustees shall direct; and said agreement shall specify the manner in which said Trustees shall give notice to the said subscribers of every call for payment; *provided*, That in case any subscribers under the provisions of this act, shall fail, neglect, or refuse to pay any installment at the time called for by said Trustees, he shall forfeit all payments previously made, and all benefits and advantages arising under the provisions of this act; *provided, however*, That the said trustees shall be bound to make a call for at least one hundred thousand dollars per quarter, for the first year after their appointment.



Section 12. Whenever and as often as the said subscribers to the said loan shall make a payment of any portion of their subscriptions, in pursuance of a call of the said Trustees, the said Board of Trustees, by their President and Secretary, under the seal of said Board, shall execute a certificate to each of the said subscribers for the amount paid by them or their respective subscriptions, with one year's interest at the rate of six per cent., added to the principal, stipulating for the payment of the same within six years, with interest at the rate of six per cent. per annum, to be computed after one year from the date of said certificate, and to be paid semi-annually thereafter; the said principal and interest to be paid by the said Trustees out of the first 4504 moneys to be realized by them from the Illinois and Michigan Canal, its assets, revenues, tolls, and lands granted to the said trustees by this act; which said certificate shall also be countersigned by the Governor, and the impress of the great seal of the State shall be affixed thereon by the Secretary of State.

Section 13. The said Board of Trustees when appointed are hereby authorized to take possession of the said canal, lands, property and assets, granted them by this act, and proceed to complete the same. They are hereby authorized to make such changes and alterations of the original plan of said canal, as they may deem advisable without reducing its present capacity, or materially changing its location, having due regard to economy, permanency of the work, and an adequate supply of water at all seasons. None of the lots, lands, or water powers so granted to the said Trustees, shall be sold until three months after the completion of the said canal; the said lots, lands and water powers shall then be offered for sale by the said Trustees at public auctions, in lots and legal subdivisions, once or oftener in each year, for the four succeeding years; said sales to be made for cash, or on credit, in the manner prescribed in the act of ninth of January, eighteen hundred and thirty-six. The said land, lots, and water powers before they are offered for sale as aforesaid shall be appraised by three disinterested persons to be appointed by the Judge of the Circuit in which said lands, lots 4505 and water power are situated, who shall take an oath faithfully and impartially to discharge the duty of ap-

praisers; said lands, lots, and water power, when so appraised, shall not be sold for less than the appraisement. After the expiration of said four years, the said Trustees shall expose the residue of said lands, which may remain on hand, to sale at such times, and in such manner, as they may deem proper. The said Board of Trustees are authorized to convey lands and water powers sold by them as aforesaid, after the purchase for the same be fully paid, but not before, and the said land and lots shall be exempt from taxation of every description, by and under the authority of any law of this State, until after the same shall have been sold and conveyed by the said Trustees, as aforesaid; Provided, also, that in the construction of the said canal, no change shall be made in its location, so as to divert the water power from canal lands. *Provided*, That in all cases where improvements were made upon the said canal lands or lots, previous to the first day of February, eighteen hundred and forty-three, the owner of such improvements shall be entitled to purchase the said lands or lots, on which said improvements are situated, at an appraisement to be made as aforesaid, without reference to said improvements.

4506 Section 14. The said Trustees shall proceed to the completion of the said canal, in a good substantial and workmanlike manner, so that the same shall, if practicable, be ready for use and navigation within two years and six months from the time this act goes into operation. The said Trustees shall keep a just, full and accurate account of all the costs and expenditures of completing and superintending the said canal, and of the rents, issues, revenues, and profits received by them from the said canal and from the property granted to them by this act; and of the amounts received by them under the said loans, and shall annually make a report to the Governor in manner and form specified in the forty-third section of the said act of January ninth, eighteen hundred and thirty-six; *Provided*, That in case the subscribers under the provisions of this act, shall fail or neglect, to complete the said canal within three years after this act goes into operation, then and in such case, the lands and property hereby granted to said trustees, shall revert to the State.

Section 15. The said Board of Trustees shall an-

nually establish a tariff of tolls to be paid for transportation on said canal, but the legislature hereby reserves the right to increase the tolls with a view to an increase of revenue, but shall not reduce the same without the consent of the Trustees, and are hereby fully authorized  
4507 and empowered to collect the same, and from time to time make, ordain and establish such reasonable rules, by-laws, and regulations, in relation to the collection of tolls, the transportation upon the canal, the conduct of boats and rafts, and the general policy of the said canal, as are usual, or may be found necessary, and to enforce the observance of the same; and that said canal when completed, shall in all future time, be free for the transportation of the troops of the United States, and their munitions of war, without the payment of any toll whatever.

Section 16. After the completion of the said canal, as aforesaid, the said Board of Trustees shall make annual dividends of the moneys which shall come to their hands from the said canal, its assets, tolls, revenues, and lands granted to the said Trustees by this act after payment of incidental expenses among the holders of the bonds of this State, in the following order: First, the said Board of Trustees shall annually make a pro rata dividend or payment of said moneys on the certificates given to the subscribers to the loan authorized by this act until said certificates and interest thereon are fully paid. Second, the said Trustee shall then make annual dividends and payments of said money upon the interest due upon the bonds and other evidences of indebtedness held by the subscribers to the said loan, a  
4508 description whereof shall have been filed with the Governor, as provided in the ninth section of this act, until the interest thereon is fully paid. Third, the said Trustees shall then make annual dividends and payments of said money upon the interest due to the non-subscribing holders of bonds or other evidence of canal indebtedness. Fourth, after paying all interest due such non-subscribing bondholders, the said Trustees shall make annual dividends pro rata upon the principal of the bonds and other evidences of canal indebtedness held by the subscribers to said loan, as provided for by the ninth section of this act, until the same shall be liquidated; at which time the trust hereby created shall

cease, and the canal shall revert to the State, with all the appurtenances thereunto belonging:

*Provided*, That the certificate of canal indebtedness, not stipulating, on their face, for the payment of interest, shall, when registered by subscribers to said loan, as hereinbefore provided, bear an interest of six per cent. per annum, from and after they shall be so registered: *Provided, further*, that no appraisal shall be made for any damages arising under the provisions of any contract, entered into in pursuance of an act for the construction of the Illinois and Michigan Canal, unless the contractor or contractors interested therein shall first signify his or their consent in writing (which writing shall be deposited with the appraisers, to be filed in the Auditor's office), that such appraisal of damages shall be made without allowing any prospective damages, or any forfeits which said contractor or contractors might have made, had they finished their jobs, but such contractor or contractors shall be allowed the value of their machinery upon the canal at the time the work stopped, and back percentage and scaleage, which entire amount of damages allowed to all contractors shall not exceed the sum of two hundred and thirty thousand dollars.

4509 Section 17. The Governor is hereby authorized and empowered to appoint three discreet and skillful persons to go onto the jobs and lettings upon the canal, and appraise the actual damage which the respective contractors upon the said canal, will sustain, in being deprived of the same; said appraisal shall be final and conclusive, unless appealed from. That if any person shall consider himself aggrieved by the decision of said appraisers, he may appeal from the same, at any time within thirty days, to the Circuit Court of the County in which the job so appraised is situated. If the Governor shall be satisfied that the appraisal is fair and honest, he shall issue certificates of Canal indebtedness, bearing interest at six per cent., to the persons in whose favor the appraisal shall be made, for the amount the holders of which certificates shall be entitled to all the privileges conferred by this act upon other holders of canal indebtedness. And the present contractors of the Illinois and Michigan Canal shall have the right to take the contract for the jobs which

they now hold, at the estimate of the engineer to be appointed by said Trustees, under such regulations and provisions as the said Trustees shall direct.

4510 Section 18. This act shall go into effect, and the said canal property and assets shall rest in the said Trustees, as hereinbefore granted, whenever, and as soon as the full amount of the said loan shall be subscribed for and the Trustees elected as hereinbefore provided; and when this act goes into effect, so much of the acts heretofore passed by the legislature of this state in relation to the Illinois and Michigan Canal, and the canal lands and property as conflicts with the provisions of this act are hereby repealed.

Section 19. Whenever the trust created by this act shall have been fully executed and performed by the said Trustees, the said canal and the canal property that may then remain shall revert to the State; and the State hereby reserves the right of paying off the bonds and certificates to be paid to the said Trustees, and the incidental expenses paid by them, and the interest thereon; and the said Trustees shall then resign the said canal and the remaining canal property and assets to the State.

Section 20. This act shall be a public act, and shall be liberally construed in all courts of justice, and the State hereby solemnly pledges its faith to supply, by future legislation, all such defects as may be found necessary to enable the said Trustees to carry into full effect the fair and obvious intent of this act.

4511 Section 21. If in consequence of any defect, omission, or objection to the foregoing act, the said bondholders or other persons, shall neglect or refuse to subscribe for the said loan, in that case the Governor is hereby authorized to negotiate, and enter into a contract with the said bondholders, or other persons in pursuance of the general principles of this act; *Provided*, That he shall make no further pledge of the faith or credit of the state, for any advance of money, but shall be limited to pledging the canal and canal property therefor: *And, provided further*, That in any negotiations to be made under the provisions of this act, for the purpose of carrying them into effect, nothing shall be done which shall in anywise interfere with the rights now secured to the holders of canal bonds. The Governor is hereby

vested with all such powers as may be necessary to carry this act into operation, or to make or cause to be made such negotiations.

4512 Section 22. The said Trustees shall employ a chief engineer of known and established character, for experience and integrity, who shall be subject to the direction of the Trustees, but shall be required to execute a bond to the Governor, in the sum of ten thousand dollars, to be approved by him, for the faithful performance of all the duties of an engineer, and shall be subject to be removed by the Governor for any good reason, which he shall make known to the next General Assembly. The said engineer, shall, in addition, be required to take an oath 'that he shall faithfully and impartially perform all the duties of his office without respect to persons, and that he is neither interested, nor will be interested in any job, work, or contract, let or to be let on the canal, or connected therewith'; which oath shall be entered and subscribed on the bond of said engineer.

AND WHEREAS The General Assembly of the State of Illinois, at their session begun on the first Monday of December, in the year of our Lord one thousand eight hundred and forty-four, passed an act entitled 'An Act supplementary to an act to provide for the completion of the Illinois and Michigan Canal, and the payment of the canal debt, approved February 21st, 1843.' Approved March 1st, 1845; which said act is in substance and affect as follows, viz.:

4513 Section 1. *Be it enacted by the People of the State of Illinois represented in the General Assembly*, That after the contract for the loan of one million and six hundred thousand dollars, as contemplated in the Act entitled 'An Act to provide for the completion of the Illinois and Michigan Canal, and for the payment of the canal debt.' Approved February twenty-first, eighteen hundred and forty-three, shall be duly executed in all respects as is provided by the terms of the above recited act, as modified by the provisions of this act, and the trustees are appointed as is contemplated in said act, the Governor of this State shall execute and deliver under the seal of State, a deed of trust to the said Trustees of all the property and effects mentioned in the tenth section of said act, which said conveyance shall include the lands and lots remaining unsold, donated by



the United States to the State of Illinois to aid in the completion of the said canal, to be held in trust as is in the said act stipulated, and it is expressly provided that the subscribers to said loan may and shall register their bonds or other evidences of indebtedness upon which they may have made or may hereafter make their subscriptions, within one year after the appointment of Trustees, and the said subscribers shall be entitled to priority in the payment of the respective advances to be made by them, and the interest thereon; also a priority in the payment of the principal and interest of the bonds or other evidences of indebtedness to be registered by them out of the proceeds of the said trust property, anything in the said act above mentioned to the contrary notwithstanding.

Section 2. The majority of the said Board of Trustees shall have power and authority to act and decide in all cases, and their acts shall bind all parties, and in appointing the said Trustees each subscriber to the said loan shall be entitled to one vote for each sum of three hundred and twenty dollars subscribed, and such election may be held in the City of New York, under  
4514 the direction of the District Judge of the United States, for that district, or such person as he for that purpose may appoint.

Section 3. In case a sufficient sum shall not be subscribed or paid, to complete said canal, the said subscribers shall have *pari passu*, with other persons, who may subscribe and pay the residue of the amount necessary to complete the canal; *provided*, That the subscribers to said loan shall have the right to subscribe and fill up the amount necessary to finish said canal, in the first instance, and if they neglect so to do, then, any other person may subscribe such amount; *And provided further*. That such subscribers may register bonds upon such subscriptions as hereinbefore provided, within one year after such subscriptions.

Section 4. When the amount due for arrears and difference of interest on the registered bonds and other canal indebtedness shall be extinguished then the principal of said registered bonds and canal indebtedness shall be paid, and when the said principal shall have been paid, the said Trustees shall proceed to pay the



interest on the unregistered canal bonds, and canal indebtedness.

4515 Section 5. The preliminary expenses of the negotiation of said contract, with the expenses of the examination of the canal property by the agents appointed by the authority of the bondholders, shall be first paid by the said Trustees unless some other provision for their payment be made by the General Assembly; but no further expense shall be incurred by the State, by sending agents to Europe or elsewhere, in relation to the matter.

Section 6. If the said canal shall not be completed within three years, as is contemplated in the fourteenth section of the above recited act, the subscribers to said loan who shall have advanced money in pursuance of their subscriptions shall not forfeit the priority of payment secured to them by this act, but shall share in the trust property *pari passu*, with such other persons as will advance further sums, if such would be necessary to complete the canal.

AND WHEREAS, After the approval of the aforesaid acts, and before the election and appointment of the said Trustees as hereinafter mentioned, the whole amount of the said loan, of one million six hundred thousand dollars, was subscribed for and filled up in strict pursuance of the provisions of the said acts and the subscribers thereto have entitled themselves to the privileges conferred upon such subscribers by the said acts.

4516 AND WHEREAS, The said subscribers to said loan, have made and executed a contract or agreement, to, and with the Governor aforesaid in strict conformity to, and with the provisions of the aforesaid acts; and did, at a meeting duly and legally summoned and called by the said Governor, to be held in the City of New York, on the twenty-seventh day of May, eighteen hundred and forty-five, duly and legally elect in conformity with the provisions of the said acts, William H. Swift, a Captain in the service of the United States, and David Leavitt, Esquire, of the said City of New York, as trustees on the part of the said subscribers, and him, the said William H. Swift, President of the said Board of Trustees.

AND WHEREAS, The said Governor has duly appointed Jacob Fry of the County of Will in the State of Illinois, to be a trustee on the part of the said State, they the

said William H. Swift, David Leavitt and Jacob Fry, now constituting the 'Board of Trustees of the Illinois and Michigan Canal' duly elected and appointed in pursuance with the provisions of the above recited acts.

AND WHEREAS, All things which the said acts require, or provide for, as necessary to be done before the execution of a deed of trust to the said Trustees having been done and completed according to the terms and requirements the said acts:

4517 *Now, therefore, be it known, to all persons whom it may concern, that I, Thomas Ford, Governor of the State of Illinois, by virtue of the powers and authority vested in me, as aforesaid, and in execution of the provisions of the aforesaid acts, as well as in consideration of the subscriptions and contract entered into by the said subscribers, and the premises aforesaid, do by these presents, hereby give, grant, sell, bargain, convey, transfer, assign and make over unto the said William H. Swift, David Leavitt and Jacob Fry, Trustees of the Illinois and Michigan Canal, as aforesaid, and to their successors in the said trust, the bed of the said Illinois and Michigan Canal, and the land over which the same passes including its banks, margins, towpaths, feeders, basins, right of way, locks, dams, water power structures, stone excavated and stone materials quarried, purchased, procured or collected for its construction; and the said canal with all hereditaments and appurtenances thereunto belonging or in anywise appertaining; and all the remaining lands and lots belonging to the canal fund, or which may hereafter be given, granted, or donated, by the General Government to the State, to aid in the construction of the said canal; and the buildings and erections belonging to the State thereon situated, also the lands and lots remaining unsold, donated by the United States to the State of Illinois to aid in the completion of the said canal. To have, to hold, possess and enjoy the premises aforesaid, without hindrance or molestation, to them, the said William H. Swift, David Leavitt and Jacob Fry, as Trustees of the Illinois and Michigan Canal, as aforesaid, and their successors, in trust, as in the said above recited acts stipulated, and to, and for, the uses and purposes in the said acts expressed and intended.*

*And so to have, hold and enjoy the said property with*

4518 the rights of controlling, managing, selling and disposing of the same, and subject to all the duties and obligations as they are set forth and specified in the said Acts of the General Assembly, until from the proceeds of the said property, and the revenue of the said canal after it shall be completed, all the moneys to be paid and trusts performed by the said Trustees, as specified in the said acts shall be fully paid, performed, satisfied and extinguished together with all just and necessary charges and expenditures incurred and to be incurred in carrying on the work and business of the said trust.

And the property of the said Trustees, the rights of the said subscribers to the said loan, or any of them, and the rights of their heirs, executors, administrators, or assigns, shall not be in anywise affected or impaired, in case any of the said subscribers to the said loan, their heirs, executors, administrators, or assigns, or the holders of bonds, or canal indebtedness, entitled to be paid by the said Trustees shall be citizens or subjects of any power at any time at war with the United States of America, or the State of Illinois.

In testimony of all which, I, Thomas Ford, Governor of the State of Illinois, in virtue of the power and authority in me vested, by force of the legislative acts above recited, have hereunto set my hand, and caused the seal of State to be affixed, this twenty-sixth day of June, in the year of our Lord one thousand eight hundred and forty-five, and of the Independence of the United States, the sixty-ninth.

THOMAS FORD.

Signed triplicate  
by the Governor,  
THOMPSON CAMPBELL,  
*Secretary of State.*

State of Illinois, } ss.  
Will County.

On the 1st day of August, 1845, the within deed was left for record and was duly recorded in Book 1, pages 563, 4, 5, 6, 7, 8, 9, 70, 71, 2, 3, & 4.

(5531)

ROBERT C. DUNCAN,  
*Recorder.*

Filed August 1st 1845.  
Fees \$8.82.

4520 GENERAL OFFICES BOARD OF CANAL COMMISSIONERS, STATE  
OF ILLINOIS.

State of Illinois, }  
Will County. } ss.

I, John M. Snyder, Acting Secretary of the Board of Canal Commissioners of the State of Illinois, and Keeper of the Records and Files belonging to said Board, do hereby certify that the above and foregoing is a true and correct copy of deed now on file in this office and in my keeping, as regards the matter herein contained.

Witness my hand and the official seal of the said Board of Canal Commissioners of the State of Illinois, this 11th day of April, A. D. 1908.

(Seal) JOHN M. SNYDER,  
*Acting Secretary as aforesaid.*

COUNSEL FOR DEFENDANT. I offer a release deed dated August 19, 1871, from the Board of Trustees of the Illinois and Michigan Canal to the State of Illinois of all the remaining property, assets and effect of the trust, which is signed by W. H. Swift, Henry Grinnell and Richard Rowett. I offer it from the book, circular 24, of the Illinois and Michigan Canal, bound with the final report of the Board of Trustees, October, 1871.

Said document was thereupon marked "Snyder Exhibit 3," and is in words and figures following, to wit:

"RELEASE DEED.

WHEREAS, the State of Illinois by virtue of an Act entitled 'An Act to provide for the completion of the Illinois and Michigan Canal,' approved February 21st, 1843, and various Acts of Legislature, of the State of Illinois, amendatory thereof, and by virtue of a certain deed of the Governor of this State, dated twenty-sixth (26th) day of June, in the year of our Lord, one thousand eight hundred and forty-five (1845), and recorded in Will County, on the first (1st) day of August, A. D. 4548 1845, in Book 'I,' pages 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573 and 574.

Did grant, convey to, and vest in the Board of Trus-

tees, of the Illinois and Michigan Canal, 'The bed of said Illinois and Michigan Canal, and the lands over which the same passes, including its bank, margins, tow-paths, feeders, basins, right of way, locks, dams, water power, structures, stone excavated, and stone and material quarried, purchased, procured or collected for its construction; and all the property, right, title and interest of the State, of, in and to the said canal, with all the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and also all the remaining lands and lots belonging to the said canal fund, or which hereafter may be given, granted or donated, by the General Government to the State, to aid in the construction of the said canal and the buildings and erections belonging to the State thereon situated.' (Reference being had to said deed for greater certainty.)

4549 And whereas the said trust has been fully and completely executed and performed by the said Board of Trustees, and whereas by the nineteenth (19th) section of said Act of February 21st, 1843, it was provided that 'whenever the trust created by this Act shall have been fully executed and performed by the said trustees, the said canal and canal property that may then remain, shall revert to the State.'

And whereas it has been made the duty of the said Board of Trustees by an Act entitled '*An Act to settle up and close the trust of the Board of Trustees, of the Illinois and Michigan Canal.*' Approved April 22nd, 1871, upon the termination of said trust, according to the provisions of the Act above referred to—to execute under their hands and corporate seal to the State of Illinois, a release deed of all and singular, the remaining property, assets and effects of every name and description of said trust.' And whereas said trust is now to be finally closed and terminated in pursuance of the laws above referred to. And whereas all and singular the accounts and transactions of said Board of Trustees have been fully examined and audited, and found to be correct, and the said trust fully and completely executed. Now, therefore, this indenture, made this nineteenth day of August, A. D. 1871, between the Board of Trustees, of the Illinois and Michigan Canal, party of the first part, and the State of Illinois, party of the second part:

WITNESSETH: That the said Board of Trustees, in

consideration of the premises do hereby remit, release, transfer and quitclaim to the said State of Illinois, all and singular, the Illinois and Michigan Canal, and all its appurtenances, and all and singular the remaining property, assets and effects of every name and description, of said trust, subject nevertheless to all the legal liabilities if any now existing against the said Board of Canal Trustees.

IN WITNESS WHEREOF, the said Board of Trustees, of the Illinois and Michigan Canal, have hereunto set their hands and caused their corporate seal to be hereunto attached, the day and year above written.

(Signed) W. H. SWIFT,  
" HENRY GRINNELL,  
" RICHARD ROWETT.

(Seal of the Board of Trustees of  
the Illinois and Michigan Canal.)

Acknowledged by each trustee, and delivered to the Governor of Illinois, September 11, 1871.

4587 Counsel for defendant offered in evidence the certified copy of the voucher of the State of Illinois to Henry S. Piepinbrink, Sheriff of Will County, at Joliet, Illinois, covering payment of the judgment in the case against Slater and Druley, with the Sheriff's costs and the costs in the Supreme Court, the total being \$956.38, to show by this and other records of the Illinois and Michigan Canal Board of Trustees, that the suit, while nominally a Druley suit, in the name of Druley and Slater, was actually defended by the State of Illinois, and the judgment paid by the State of Illinois.

(Which said document marked Snyder's Exhibit 11 was received in evidence and is in the words and figures following, to-wit:)

4588

## COPY:

"SNYDER EX. 11."

FOR MAINTAINING AND OPERATING THE ILLINOIS AND MICHIGAN CANAL AND LOCKS IN THE ILLINOIS RIVER.

STATE OF ILLINOIS

To Henry F. Piepenbrink, Dr.

No. 311 Address Sheriff Will County, Joliet, Ill.

1882 Place but one item on each line of the column.

Dollars Cts.

May 31	For amount of judgment rendered in Appellate Court, April 6, 1881, in case of Wm. Adam vs Robert S. Slater & Wm. M. Druley	800.00
	For interest on said judgment Apr. 6/81 to June 10/82, 1 yr—2 mos. 4 days at 6%	56.53
	Paid under protest see Canal Commissioners Record Book under date of June 8, 1882	79.00
	For costs in Appellate Court in said case Less amount paid by Canal Commissioners Sep 12/81	9.60
		69.40
		<hr/> 30.15
	For costs in Supreme Court in said case Less amount paid by Canal Commissioners Oct. 14, 1881	10.00
		20.15
	For Sheriff's costs since rendering of judgment	10.30
	Charged to Tolls and Rents	956.38
	Examined and Found Correct.	
	The above has been received and the work performed.	
	B. F. SHAW	
	Secy.	

WM. THOMAS  
Supt.



4589 Received from the Treasurer of the Board of Canal Commissioners.

Nine hundred fifty six and 38/100 Dollars, In full for the above account, and it is hereby certified that the articles as specified in the above voucher have been furnished to the Board of Canal Commissioners for the use of the Illinois and Michigan Canal, of the Locks in the Illinois River, and that the prices charged are the lowest market price for the same.

HENRY F. PIEPENBRINK,  
*Sheriff.*

Dated Joliet, Illinois, 6/15/82.

Signed Duplicates, approved for payment.

I. O. GLOVER,  
*President.*

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GENERAL OFFICES BOARD OF CANAL COMMISSIONERS,  
STATE OF ILLINOIS.

State of Illinois }  
Will County } ss.

I, John M. Snyder, Acting Secretary of the Board of Canal Commissioners of the State of Illinois, and Keeper of the Records, and Files and Seal belonging to said Board, do hereby certify that the above and foregoing is a true and correct copy of Voucher Number Three hundred and eleven (311), issued to Henry F. Piepenbrink, as Sheriff of Will County on May 31st, 1882, of the Board of Trustees of the Illinois & Michigan Canal, now in this office and in my keeping, as regards the matter therein contained.

Witness my hand and the official seal of the said Board of Canal Commissioners of the State of Illinois, this Sixth day of June A. D. 1908.

(Signed) JOHN M. SNYDER,  
*Acting Secretary as aforesaid.*

(Seal)

4590 Counsel for defendant offered in evidence as Snyder's Exhibit 12 a voucher to G. D. A. Parks, who will be shown to have been the attorney who appeared of record for Slater and Druley in the case of Adams against Slater and Druley, for services in the case of Slater *et al.*, in the suit of

Adams, to \$300.00; for advance printer's fees for brief, \$40.00; total, \$340.00.

(Which said document was received in evidence, and is in the words and figures following to-wit:)

4591

## COPY.

## "SNYDER'S EX. 12."

FOR MAINTAINING AND OPERATING THE ILLINOIS AND MICHIGAN CANAL AND LOCKS IN THE ILLINOIS RIVER.

STATE OF ILLINOIS,

T. G. D. A. Parks, Dr.

No. 47

Address Joliet, Ills.

1881 Place but one item on each line of this column.

		Dollars, cts.
January 3	To services in case Slater <i>et al.</i> ads	
	to date	300.00
	For advanced printer's fee for brief	40.00

Charges to Tolls and Rents	340.00
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Examined and Found Correct.

The above has been received and the work performed.

B. F. SHAW,  
Sec.

(Signed) WM. THOMAS

Supt.

Received from the Treasurer of the Board of Canal Commissioners, three hundred and forty No/100 dollars, in full for the above amount, and it is hereby certified that the articles as specified in the above voucher have been furnished to the Board of Canal Commissioners for the use of the Illinois and Michigan Canal of the Locks in the Illinois River, and that the prices charged are the lowest market prices for the same.

G. D. A. PARKS.

Dated Joliet, Illinois, Jan. 13, 1881.

Signed in Duplicates, Approved for payment.

(Signed) J. O. GLOVER,  
President.

4592      GENERAL OFFICE BOARD OF CANAL COMMISSIONERS,  
STATE OF ILLINOIS.

State of Illinois }  
Will County        } ss.

I, John M. Snyder, Acting Secretary of the Board of Canal Commissioners of the State of Illinois, and Keeper of the Records and Filed and Seal belonging to said Board, do hereby certify that the above and foregoing is a true and correct copy of voucher No. 47, issued to G. D. A. Parks, Joliet, Illinois, January 3rd, 1881, of the Board of Trustees of the Illinois & Michigan Canal, now in this office and in my keeping, as regards the matter therein contained.

Witness my hand and the official seal of the said Board of Canal Commissioners of the State of Illinois, this 8th day of June, A. D. 1908.

(Signed) JOHN M. SNYDER,  
(Seal)                      *Assistant Secretary as aforesaid.*

4593      Counsel for defendant also offered in evidence a certified copy of a resolution of the Board in regard to the payment of the judgment and costs, made May 10, 1882.

(Which said document was received in evidence and is in the words and figures following, to-wit:)

4594

“SNYDER EX. 13.”

COPY OF PREAMBLE AND RESOLUTION IN REGARD TO PAYMENT  
OF JUDGMENT AND COSTS IN CASE OF ADAM VS. SLATER &  
DRULEY, MAY 10TH, 1882.

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On Motion the Following was Adopted:—

WHEREAS, in the case of William Adam vs. Robert P. Slater and Wm. M. Druley brought in the Circuit Court of Will County at the ..... term A. D. 1878, for the diversion of the water of the Desplaines River from the mill of said plaintiff and appealed to the Appellate Court, in which court, the judgment of said court was reversed and a judgment rendered in favor of said plaintiff for \$800, for damages, and costs of suit, which judg-

ment was afterwards affirmed in the Supreme Court on appeal thereto, as will more fully appear by reference to the report thereof in the 101st vol. of the reports of said Supreme Court and

WHEREAS the alleged diversion for which said recovery was had was of water supplied to said Slater and Druley under a lease to them executed by this Board dated July 11, 1878, whereby it became equitably and justly incumbent on the State to assume the responsibility of such suit.

THEREFORE RESOLVED, That the said judgment and costs be paid but with a view to saving the future rights of the State, that said judgment be paid under protest.

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4595 GENERAL OFFICE BOARD OF CANAL COMMISSIONERS,  
STATE OF ILLINOIS.

State of Illinois }  
Will County. } ss.

I, John M. Snyder, Acting Secretary of the Board of Canal Commissioners of the State of Illinois, and Keeper of the Records and Files and Seal belonging to said Board do hereby certify that the above and foregoing is a true and correct copy from the Record Book No. 4, page 235, of the Board of Trustees of the Illinois & Michigan Canal, now in this office and in my keeping, as regards the matter therein contained.

Witness my hand and the official seal of the said Board of Canal Commissioners of the State of Illinois, this Sixth day of June, A. D. 1908.

(Seal) (Signed) JOHN M. SNYDER,  
Acting Secretary as aforesaid.

4596 Counsel for complainant stated that he further offered it as a basis of showing hereafter the position taken by these people as to the condition of this river in the filing of their briefs in the Supreme Court.

4836 COUNSEL FOR DEFENDANT. We have here the briefs filed in the Appellate and Supreme Courts in the case of Druley against Adams, and we have also the abstract of the records in that case which was signed by the counsel for both parties, and signed by the judge. We haven't here any per-

son who can prove that those are identical with the abstract and the briefs filed in that case. We can produce such proof. We will produce Mr. Knox to testify that they are duplicates. We can produce him and he will so testify. His home is in Joliet.

COUNSEL FOR COMPLAINANT. In order to avoid a continuance for that purpose, counsel for complainant states that the witness named when produced will testify as counsel states, but we insist that the evidence to which the witness would so testify is irrelevant, incompetent and immaterial.

COUNSEL FOR DEFENDANT. The doctrine under which we claim the right to introduce him is that as to matters in controversy in a lawsuit statements or admissions made by a party at any time at any place are competent, and that is especially so of statements made in proceedings of record to which such party was a party or where he was the real party in interest. The introduction of briefs—in my experience—I have known it a number of times as being of the same nature as pleadings. Pleadings are always taken up as admissible against a party. We have established in this case that while the nominal party was Mr. Druley, the actual party was the State. The Canal Commissioners, by their resolution said it was their duty to assume, the State's duty to assume, and the state retained and paid the attorney who appeared in the case for Druley and Slater and paid the fees in that case. The record shows clearly that it was really a suit by the State. The rights of the State or what was contended for throughout were in the briefs of both parties. It is upon that theory that we claim they are admissible.

4838 Said book was introduced (App. II, p. 3905; Trans., pp. 6059-6256; Abst., pp. 1733-1827), and counsel for defendant read from the abstract of record, Circuit Court of Will County, filed in the Supreme Court, September Term, A. D. 1881, William M. Druley, Appellant, vs. William Adam, Appellee. Appealed from Appellate Court, Second District, a portion on page 2:

"BE IT REMEMBERED, &c., that evidence was introduced which for the purposes of this appeal, it is stipulated by and between the parties established the following facts. And then sets out the ownership on the part of the plaintiff of the property in question, his having succeeded to Philo A. and Orlando H. Haven, having had mills propelled by water power upon the river, the water

being derived from the river. That the canal was open for navigation in the spring of 1884; that the Summit division of said canal terminates at Lockport, Illinois, on Section 23, Town 36, Range 10, and was improved by the City of Chicago so as to make a continuous level drawing water from Lake Michigan from the terminus of the South Branch of the Chicago River to Lock No. 1, aforesaid under the Act of the General Assembly of date 4839 February 16, 1865; that said improvement was completed about May 1, 1871; that the State of Illinois, by Act of the General Assembly, assumed charge of said improved level in the year 1871, by Act of date October 20, 1871, and has since controlled the same.

That from Dam No. 2 in Joliet, south the canal level is known as the Channahon level; that all the water which is put into said level for any purposes is drawn from the pool formed by Dam No. 2 at Joliet, above plaintiff's dam, and since the building of said canal and its opening in 1848, until the completion of the structures of defendants no water had ever been drawn from said level, or had been put into the same except as required for navigation purposes, nor had any water power been used or leased on said level.

That there is more water introduced into the Summit level of said canal by reason of the improvement known as the deep cut, above referred to, than is required for navigation purposes, and more than is required for the purposes of the canal between Locks 1 and 2, 2 and 3, and 3 and 4, on said canal between Lockport and Joliet; that the use of such surplus water is leased to Norton & Co., at Lockport, so far as they may require, and the balance is discharged by a spillway,—both the water used by Norton & Co. and that discharged by said spillway being 4840 conducted by a race shown in map 1 from the hydraulic basin, connected with the canal, also shown on said map, to the Desplaines River, as shown on said map, at a point in Section 23, in said Town, and from thence mingled with the other water of said river, follows the bed of said stream through Section 22, 23, 27 and 34 in the Town of Lockport, and partially through Section 3, in the Town of Joliet, as shown by said map, to a point where said canal effects a junction with said river."

"That from said point in Section 3 aforesaid where said junction is made to Dam No. 2 in Joliet, said canal

4842 is contained within artificial banks or walls of stone, but comprises the original bed of said river, and leaving said river as shown on said map at Dam No. 2.

That there is a mill site and mill on said river, Sec. 23 in Lockport, and has been for many years; and that from the points on Sec. 23 where said surplus water is discharged to the point on Sec. 3 in Joliet, where the canal enters into the bed of said river, there is no connection between said canal and said river, and no structures, works or improvements of any kind were ever placed on said river, or any control exercised over the same by any canal authorities or the state, for any purpose; that said waste-weir is never used except in case of high water and floods, or when it is necessary to draw off the water from the level for the purpose of repairs, there usually being no more water than is utilized at Norton's mills.

That the amount of water which is discharged into the Desplaines River at Lockport from the Summit division of said canal through said spillway and Norton & Company's race is about 25,000 cubic feet per minute; that the amount of water required for navigation purposes on the canal from Lock No. 1 to Dam No. 1 is about 1,220 cubic feet per minute. That the amount of water required for navigation purposes of said canal from Dam No. 1 to the end of the Channahon level is about 3,300 feet per minute, and the amount required  
4843 for navigation purposes on the Channahon level alone is about 2,800 cubic feet per minute."

COUNSEL FOR DEFENDANT. Your Honor will note it discharged in 1881—25,000 cubic feet per minute, and the amount required to be taken out for navigation purposes was 2,800 cubic feet per minute.

"That since the completion of the deep cut and the turning of such surplus water into the river at Lockport the amount of water flowing over Adam's dam at Joliet before the diversion of the water herein complained of was greater by two-thirds, as estimated, than the amount flowing over said dam prior to said deep cut improvement, and that the amount of water passing over Adam's dam since the diversion complained of is double the amount which passed over said dam before the completion of the deep cut.



That the season during which said canal is open for navigation on said Channahon level is generally from March 25th to November 25th in each year."

And also from the brief of Mr. G. D. A. Parks, attorney for the appellees in the Appellate Court, Second District, December Term, 1880, being in the same case, page 3—it is page 1 of the brief for appellees:

"The record presents the following as the principal points for consideration:

First: Viewing the state and Adams, in the relation of upper and lower riparian proprietors on the Des-  
4844 plaines River, is the state guilty of a *diversion*, if it takes out above Adam's dam no more water than it brings in from Lake Michigan through its own canal?

Second: Even if the state itself be supposed guilty of a diversion by the act of passing the water from the pool above Dam No. 2 down to the Channahon level on which the oat mill of the appellees is situated, and where it can by no possibility again become available to the appellant, whatever use is made of it, can the appellees, Slater & Druly, be sued as the responsible agents in the act of diversion, which is thus already irrevocably consummated by operations at the lock and dam above?

Third: Adam having purchased subject to the release executed by his grantors in 1853, does that relief operate to bar the action?

Now, how have the legal attributes of this water, with reference to the rights of the appellant, been essentially changed? The plan of the canal as to the disposition of the surplus water, obviously contemplated this very mode of transmission from one level to another. The total fall between Lockport and Joliet is about 60  
4845 feet, and in that part of the canal which concerns this case, it will be seen, there are seven successive levels; 1st, the Summit level; second, that between Locks 1 and 2; 3rd, between Locks 2 and 3; 4th, between Locks 3 and 4; 5th, between Lock 4 and Dam No. 1; 6th, between Dams 1 and 2; 7th, the Channahon level.

Into the Summit level Lake Michigan, by the recent improvement, supplies, as was contemplated in 1836, a large quantity of surplus water, estimated at about 25,000 cubic feet per minute, not needed for navigation, but very valuable to the State of Illinois and the manu-

facturing interests of Lockport and Joliet, for hydraulic purposes.

The plan of the canal within this distance affords four falls available to the state for water power—one at Lockport, leased to Norton & Co.; one at Dam No. 1, one at Dam No. 2, and one on the Channahon level, a portion of which is leased to the defendants. Thus the same volume of water is repeatedly used on successive levels within a space of about four miles.

4846 Recently the Canal Commissioners found that the surplus water at their disposal from the level above Dam No. 2 was such that after leasing all that could be leased to advantage at the dam, and after transmitting to the appellant more than double the amount he was accustomed to receive through his own pitiful stream before the deepening of the cut" (the reference being to the Desplaines River) "there was still a large surplus that could be utilized most profitably by the state, in the method exemplified in the case at bar, viz: by drawing it directly through openings from the canal itself, and then discharging it into the river, but necessarily and unavoidably below the plaintiff's dam."

4847 On page 25:

"The fact then, that this link of communication between the hydraulic basin at Lockport, and the upper basin in Joliet," (that being Section 22, 23, 24, 27, the river in those sections) "in which the river discharges as a feeder, does not belong to the state, is, I submit, quite immaterial to the argument. It is a circumstance affecting only and exclusively the relations between those particular intermediate owners and the state. In fact, for fully two-thirds of the way, as will be seen, the river runs through canal lands, which must be supposed to have been sold subject to the right of the state to the use of the channel. But those also who purchased from the government of the U. S. must have done so after the plan of the canal connecting with the Desplaines River as a feeder was adopted, and with full knowledge of and reference to it." That language does not apply to the state, but applies to odd sections 22, 27, 23.

4848 "2. The action was brought in evasion of our express and established public policy, in respect to controversies

with the state, arising from the management of the canal by her official agents. 8 St. cited *supra*."

That is they could not sue the state, and they tried to avoid that by suing its commissioners.

"It is very distinctly a case coming within the reason and spirit of this wise policy of the government. Confessedly, it is a dispute between William Adam and the State of Illinois, involving the control, at Joliet, of the immense volume of surplus water which pours down from Lake Michigan through the deep cut. If Adam has been aggrieved, the state should pay the damage, and it constitutional and statutory provision, while thus taking the rights and liabilities of the state out of the jurisdiction of her judicial tribunals, contemplate that her legislature will do him ample justice. To that resort, however inconvenient, he is confined."

On page 2, of the brief and argument for appellant in 4849 the Supreme Court of Illinois, at the September Term, 1891. On page 2, the last paragraph at the bottom of the page:

"When the canal leaves the river at Dam No. 2, it pursues a southwesterly direction, diverging gradually more and more from the river, this being known as the Channahon level. On this level, and about half a mile below Adam's mill dam, the defendants in 1878 erected an oat mill on the berm or westerly bank. The Canal Commissioners had discovered, that by simple and not very expensive structures, a valuable water power, promising to yield a considerable addition to the revenues of the canal, might be developed in this quarter of the Town of Joliet; and accordingly made to Slater and Druley a ten years' lease of sufficient water to run their mill, under which lease the defendants proceeded to put their enterprise into operation. Their establishment is situated nearly a mile below Dam No. 2, where the river and the canal part company. It is for this water thus drawn from the canal, at a point far below the plaintiff's mill, and far below Dam No. 2, that the action was brought against them as lessees of the state; Adam not choosing to make his contest directly with the state herself."

Your Honor notices that the mill which was using the diverted water was below the Adam's mill, and they got 4850 the water of the river to it by carrying through the canal and around Adam's mill more water than was necessary for the purposes of navigation. The stipulation by which the Havens settled with the state, or the Canal Commissioners, being that the state should use only such water as was necessary for navigation.

"It has never been, and of course cannot be pretended that the surplus water in question is to be described as any part of the natural and customary flow of the Desplaines River; if by that expression is meant the flow derived from its natural sources and affluents in the watershed which it drains. The Desplaines is in truth a very insignificant stream, never of much use as a feeder in the season when its services are most needed, and, except as reinforced by contributions from the canal, affording sites only, for what are sometimes denominated 'thunder shower mills.'

In 1871, when the Summit level from Chicago to Lockport was finished on the original deep cut plan, which the pecuniary embarrassments of the state had for so many years suspended, drawing its supply directly from Lake Michigan, as the fountain head, the Canal Commissioners found themselves in possession on the Summit level of a vast surplus of water, ten fold beyond 4851 what was required for navigation. The question then met them, how they could best utilize it for the canal revenues, and the public good?"

"First. Subject only to the reciprocal rights in the flow of the water existing between the dominant and servient estates, each riparian proprietor is the owner of the bed and banks forming the channel of a water course as absolutely to all intents and purposes, as he owns his farm upon its borders; and he may use it with precisely the same perfect and unqualified rights of dominion. No one can call him to account for such use, save only in respect to the water which flows upon, through and from his land. This doctrine is too familiar to need the support of authorities."

From page 4 of the same brief:

"The compromise was assented to by the trustees, because on their part they did not choose to be harassed with perpetual suits for even nominal damages.

4852 The Appellate Court, however, if we rightly apprehend its decision, adopted the conclusion, not only that the release was no bar to the action, but that it even had the effect of giving to the plaintiff as grantee of the Havens, a right to claim a riparian proprietor this vast additional volume of water, produced eighteen years afterwards by an improvement which entirely revolutionized the former system of supply—an addition exceeding probably twenty times the natural flow of the Desplaines in 1853.

Holding that court, as we do, in the highest respect, we must, nevertheless, be permitted to insist here most strenuously and confidently that their position is unwarranted by any just construction of the release.

The whole transaction between the Havens and the canal Trustees, had reference to the *state of things then existing*.

The canal had been completed in 1848 upon the shallow cut or raised level plan, as the best the state in those hard times could do. Instead of a direct and never-failing supply from the lake, the level was to be supplied by the poor expedient of pumps at Bridgeport, reinforced by the Calumet, and the feeble and uncertain tributes in spring and fall of the Little Desplaines. There are probably upon the bench of this court those who personally know how little anybody in Illinois at that early day expected the time would ever come when this channel would be carved deep through miles of solid rock to the inexhaustible bosom of the lake."

On page 49, still continuing the argument on the release of the Havens upon contract to compromise, and why it was entered into:

4853 "The Desplaines was not much of a stream, but the trustees wanted to control it as a feeder for whatever it was worth, without the liability of incessant lawsuits."

On page 39 (additional brief for appellant):

"In the case at bar the state is *directly* interested, not as a party it is true, but in the result. If this judgment is collected, the state would be both legally and morally bound to refund the money to the appellants. And then again, if the judgment of the Appellate Court is affirmed, all revenue to the state from this source will be lost."

And from the petition for rehearing filed at the March Term of the Supreme Court of Illinois, March Term, 1882, petition signed by the same attorneys, G. D. A. Parks, and also by E. F. Bull, as attorneys for the petitioner:

"May it please your Honors:

So important are the public rights involved in this case, so novel some of the questions it presents, and from certain special circumstances happening to attend it so disastrous to the interests of the canal the final establishment in this court of the claim of the appellee, that we must earnestly entreat the court to reconsider its judgment."

On page 36:

4854 "Is it not settled by an overwhelming weight of authority that an upper riparian proprietor on a natural water course is only bound to deliver to the one below the natural and ordinary flow which he has received from the one above; and, as corollary to this, that if he adds to the stream from an independent source or reservoir of his own, he may again deduct it or an equivalent quantity?"

I omitted one paragraph on page 14, or rather the bottom paragraph on page 13:

"What is there in this mode of passing the water from one point to another on the canal, which is supposed to sever the right of the state to it? Simply this, at Lockport, the river is lower than the canal; at Joliet, at the point of intersection, the canal is lower than the river. At Lockport, the surplus, which we admit must be got rid of there in some way, is discharged into channels which lead down to the Desplaines, not far distant. But when discharged, the relative course and comparative levels of the two water courses are such, that it is destined to rejoin the canal on the fifth level below the summit level, that is, on the level between Lock No. 4 and Dam No. 1. It thus leaves the canal under the necessary concomitant condition of returning to the canal and of returning to it before the beneficial rights of the appellee, as a lower riparian proprietor, become involved. If abandonment, in the sense in which the term is here used, depends at all on intention, we absolutely know from the original  
4855 plan of the canal itself, and there was not and could not be any intention on the part of the state to abandon the

water at Lockport irreclaimably to public use, save for the distance between the two levels."

I may say parenthetically, there was the contention that the intention of the parties at the time, as one act, was to discharge the water, but to reclaim it again when it got down to the outlet of the canal.

"If, then, by a physical necessity, the water was to return to the possession of the state, is it not impossible to successfully maintain that it was intentionally abandoned?"

Thus the question narrows itself to a single point: Supposing that the state *intended* to assert whatever legal rights she had or might have in this water after it should have been restored to the canal, does the fact of its previous transmission from the one point to the other through the medium of the Desplaines river, a channel not belonging to her, preclude her claim?"

6057 ABSTRACT OF BOUND VOLUME OF ABSTRACTS AND BRIEFS IN  
DRULEY V. ADAM.

(App. II, p. 3905, referred to C. E., p. 3001; Trans., p. 4838; Abst., p. 1420.)

Exhibits put in by the defendant.

(1)

6059 SUPREME COURT OF ILLINOIS,  
Northern Grand Division.  
September Term, A. D. 1881.

William M. Druley,	}	Second District. Appeal from Appellate Court
<i>Appellant,</i>		
<i>vs.</i>		
William Adam,		
<i>Appellee.</i>		

ABSTRACT OF THE RECORD OF CIRCUIT COURT.

3 NARR. Alleges possession by plaintiff of certain lots of land with mills thereon situate; the enjoyment of the use of the water in Desplaines river, and the right to



use; that defendants by means of ditches, trenches, gates, &c., diverted the water of said river so that the same did not flow to plaintiff's mill as of right it should have done. Damage, \$5,000.

4        ADDITIONAL COUNT. Alleges possession and right to use water of Desplaines river; that defendants, pretending to have license from Canal Commissioners said Canal Commissioners having the right to use the water of the river for navigation purposes only, cut certain channels so that the surplus water in said river not needed for navigation purposes in said canal, which would have flowed to plaintiff's mills, was drawn from said canal into the Desplaines river below the mills and lots of plaintiff in such manner that the water of said  
6060 stream was diverted into said canal in a much greater quantity than was needed for navigation purposes, and than the commissioners had any right to draw the same above the lots and mills of plaintiff, discharged below the same, so that the water of the river did not run as it had heretofore run, so that the plaintiff was deprived of its uses, &c.

(2)

5-15    PLEA. General notice, with a notice which contains no other facts than are found in the statement of facts forming the bill of exceptions.

18        JUDGMENT *pro* defendants; exception and prayer for appeal, &c.

19

#### BILL OF EXCEPTIONS.

Be it remembered, &c., that evidence was introduced which, for the purposes of this appeal, it is stipulated by and between the parties established the following facts:

That the plaintiff at the time of the commencement of this suit was possessed as the owner of lots 1, 2, 3 and 4 in block 45, and lots 1, 2, 3, 4, 5, 6, 7 and 8 in block 57, and lots 1, 2, 3, 4 and 6 in block 62, all in the School Section Addition to Joliet in Will County, Illinois; said  
20 addition comprising the whole of Section 16, Town 35, Range 10 East, 3d P. M.; and that said plaintiff and his grantors have been in possession of said premises continuously since the year 1852, and prior thereto; and the said grantors to plaintiff were Philo A. and

Orlando H. Haven; that said premises are located on the Desplaines river, a natural water course running through said Section 16; that a dam, herein called Adam's Dam, is and has been standing across said river since prior to the year 1852, and that said premises have been used continuously to the date of trial by plaintiff and his grantors for mill purposes, deriving the power therefor from said Desplaines river.

That said plaintiff now and for many years has located on said premises mills propelled by water power derived from said river, and has had at the date of the diversion of water complained of located on said premises six wheels, four of which are in place to be used and which are reasonably fitted to use the water in the river, and do not require to put them in use any unreasonable detention or employment of the water flowing in said river.

6061 That the location of said premises with reference to the Illinois & Michigan Canal and the Desplaines river in the City of Joliet, is correctly shown by the map marked "A," which shall be sent up with the record herein; and that the location and course of the Desplaines river and the Illinois & Michigan Canal from the north line of Section 22 and 23 in Town 35 north, Range 10 East (being the Town of Lockport) to the south line of Section 16, Town 35, Range 10 East (being the Town of Joliet) with the locks, levels and dams of said canal in said distance,

(3)

the dam of said Adam and the structure of said defendants on said canal below Adam's Dam are correctly shown by the map marked "13," to be sent up with this record.

That said canal was opened for navigation in the spring of the year 1848.

21 That the summit division of said canal terminates at Lockport, Ill., on Section 23, Town 36, Range 10, and was improved by the City of Chicago so as to make a continuous level of drawing water from Lake Michigan from the terminus of the south branch of the Chicago river to Lock No. 1 aforesaid, under the Act of the General Assembly of date February 16, 1865; that said improvement was completed about May 1, 1871; that the State of Illinois, by Act of the General Assembly, as-

sumed charge of said improved level in the year 1871, by Act of date October 20, 1871, and has since controlled the same.

That from Dam No. 2 in Joliet, south the canal level is known as the Channahon level; that all the water which is put into said level for any purposes is drawn from the pool formed by Dam No. 2 at Joliet, above plaintiff's dam, and since the building of said canal and its opening in 1848 until the completion of the structure of defendants no water had ever been drawn from said level, or had been put into the same except as required for navigation purposes, nor had any water power been used or leased on said level.

That there is more water introduced into the summit level of said canal by reason of the improvement known as the deep cut, above referred to, than is required for navigation purposes, and more than is required for the purposes of the canal between locks one and two, two and three, and three and four, on said canal between Lockport and Joliet; that the use of such surplus water is leased to Norton & Co., at Lockport, so far as they may require; and the balance is discharged by a spillway,—both the water used by Norton & Co. and that discharged by said spillway being conducted by a race, shown in map 1, from the hydraulic basin, connected with the canal, also shown on said map, to the Desplaines river, as shown on said map, at a point in Section 23, in said town, and from thence mingled with the  
6062 other water of said river, follows the bed of said stream through Section 22, 23, 27 and 34, in the Town of Lockport, and partially through Sec. 3, in the Town of Joliet, as shown by said map, to a point where said canal effects a junction with said river.

(4)

That from said point in Section 3 aforesaid where said junction is made to Dam No. 2 in Joliet said canal is contained within artificial banks or walls of stone, but comprises the original bed of said river, using the same, and leaving said river as shown on said map at Dam No. 2.

That there is a mill site and mill on said river, Sec. 23, in Lockport, and had been for many years; and that from the point on Sec. 23 where said surplus water is discharged to the point on Sec. 3, in Joliet, where the canal enters into the bed of said river there is no connection

between said canal and said river, and no structures, works or improvements of any kind were ever placed on said river, or any control exercised over the same by any canal authorities, or the state, for any purpose; that said waste-weir is never used except in case of high water and floods, or when it is necessarily to draw off the water from the level for the purpose of repairs, there usually being no more water than is utilized at Norton's mills.

23 That the amount of water which is discharged into the Desplaines river at Lockport from the summit division of said canal through said spillway and Norton & Co.'s race is about 25,000 cubic feet per minute; that the amount of water required for navigation purposes on the canal from Lock No. 1 to Dam No. 1 is about 1,220 cubic feet per minute; that the amount of water required for navigation purposes of said canal from Dam No. 1 to the end of the Channahon level is about 3,300 feet per minute, and the amount required for navigation purposes on the Channahon level alone is about 2,800 cubic feet per minute.

That since the completion of said deep cut and the turning of such surplus water into said river at Lockport, the amount of water flowing over Adam's Dam at Joliet before the diversion of the water herein complained of was greater by two-thirds, as estimated, than the amount flowing over said dam prior to said deep cut improvement, and that the amount of water passing over Adam's Dam since the diversion complained of is double the amount which passed over said dam before the completion of the deep cut.

That the season during which said canal is open for navigation on said Channahon level is generally from March 25th to November 25th in each year.

6063 That defendants' premises are located on the berm or western bank of said canal, on said Channahon level, about half a mile southwest of

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24 plaintiff's dam; that defendants built a tunnel under said canal, put in water wheels, and at the date of commencing said suit had been drawing water from said Channahon level of said canal to the extent of from 6,000 to 8,000 cubic feet per minute to operate their mill, discharging the same into the Desplaines river

below the plaintiff's dam and at a lower level on said river than said dam, so that the use of said water was wholly lost to plaintiff; that but for the diversion of said water from the pool above Dam No. 2 of the Illinois and Michigan Canal into the Channahon level of said canal, and for such use by defendants, all of said water would have naturally flowed in the banks and bed of said river to said plaintiffs dam and water wheels, and could have been used by him.

That such use of said water from said canal by said defendants is by virtue of a lease for such purpose executed to said defendants by the Canal Commissioners of the State of Illinois.

That said mill of defendants and said structures for using said water had been in use at the date of the trial about two years, and that plaintiff could have used and had machinery wherewith to use all water so used by said defendants, and that the annual damage to plaintiff is from \$800 to \$1,000 per annum; that plaintiff's damage to date of trial is from \$1,600 to \$2,000.

That the course of said canal, as shown by said maps, is as originally laid out and completed in 1848.

25 That said Philo A. and Orlando H. Haven, the plaintiffs' grantors, while in possession of said premises, commenced suit against the Trustees of the Illinois and Michigan Canal, about the year 1848, to recover damages for the diversion of the Desplaines river into said canal and away from said dam; and that said suit is the identical one referred to and decided in the 5th Gilman Reports, page 548, and in the 11th Illinois Reports, page 554, and is of and concerning the same dam that plaintiff is now in possession of.

That before final judgment in said last named suit and on, to-wit: the 22nd day of August, A. D. 1853, an agreement in writing was executed between said Philo A. and Orlando H. Haven, of the one part, and said Trustees of the Illinois and Michigan Canal of the other part, in words and figures as follows, to-wit:

6064 Whereas a suit has been and is now pending at the instance of Philo A. Haven and Orlando H. Haven, against the Board of Trustees of the

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Illinois and Michigan Canal, in the Circuit Court of Will County, Illinois, in consequence of alleged damages to

a certain mill owned by said Philo A. Haven and Orlando H. Haven, situated on the Desplaines river at Joliet, Will County, Illinois, occasioned by diverting the water of said river from said mill and applying it to the use of the Illinois and Michigan Canal above said mill; and whereas the said Board of Trustees and the said Philo A. Haven and Orlando H. Haven being mutual desirous of avoiding further litigation:—

Therefore we, the said Philo A. Haven and Orlando H. Haven, for and in consideration of the sum of Three thousand and sixty dollars to us paid by the said Board of Trustees of the Illinois and Michigan Canal, the  
26 receipt whereof is hereby acknowledged, do hereby release and forever discharge the said Board of Trustees and their successors in office, from all actions, rights of action, and all claim arising out of any damages heretofore, now or hereafter, to be sustained by us, by reason of the use of the waters of said Desplaines river, for the purpose of supplying said canal, in the manner the same is now supplied at the feeder at Joliet. In further consideration of the said sum of Three thousand and sixty dollars, herein expressed to have been received by us, we hereby remise, release and forever quit-claim to the Board of Trustees and their successors in office, and to the State of Illinois, whenever said canal shall revert to said State, the right to use and appropriate the water of the said Desplaines river at the feeders at Joliet, below Guard Lock No. 1 for supplying the said canal for the purpose of navigation in the same manner the water in said river in connection with other feeders is now used for supplying said canal.

We further agree that when, at any time, the Superintendent or other person having charge of said canal shall desire to reduce the quantity of water above our said mill-dam for the purpose of repairing said canal, its banks or other appurtenances at any point between our  
said mill and the dam across said river at said  
27 feeder, that said Superintendent, or other person having charge of said canal, may reduce the water above said mill-dam, provided the water at our said mill-dam shall not be reduced lower than the top or comb of our said mill-dam, which may be done by opening the waste-ways at the west end of said mill-dam, which shall be closed by said Superintendent as soon as said repairs

can be completed, and shall not be opened except for such repairs as aforesaid, nor remain open more than for the period of one

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week at any one time, without such compensation as may be agreed upon by any two persons to be selected by us for that purpose.

6065 We further agree to dismiss all suits now pending at our instance against said Board of Trustees in the Circuit Court of Will County, Illinois, and pay all costs of court that may remain unpaid at the time said suit or suits shall be dismissed.

In witness thereof the said Philo A. Haven and Orlando H. Haven have hereunto set their hands and seal this 22nd day of August, 1833.

PHILO A. HAVEN, (Seal)

by O. HAVEN,

*His Attorney in Fact* (Seal)

ORLANDO H. HAVEN (Seal)"

28 And that the sum of money mentioned in said agreement was paid and receipted for, said receipt being in words as follows:  
"3,060.

Received, Lockport, Aug. 22d, 1853, from David Leavit Treas. for the Board of Trustees of the Illinois & Michigan Canal, by the hands of William Gooding, Secretary, the sum of Three Thousand and Sixty Dollars, in full, on settlement of our claim for damage against the Board of Trustees of the Illinois & Michigan Canal.

PHILO A. HAVEN,

by O. H. HAVEN,

*His Attorney in Fact.*

O. H. HAVEN."

It is further agreed that no evidence proving or tending to prove any other facts than as herein stated and referred to, to wit: Said maps were offered by either party on the trial of said cause; that the evidence offered was offered by each party hereto subject to such material objections thereto, except for matters of form as might be made; that this statement of the proofs and of the facts proved herein shall stand as and be signed by the court and filed in this cause as a proper and sufficient bill of exceptions in this case, and that no other or farther one shall be required, but that nothing herein



stated shall (should a re-trial be had of this case or of any other) prejudice the rights of either party to introduce on such trial farther, other or different evidence proving or tending to prove any different fact or facts.

29 It is further agreed that on such evidence and proof, the said court wherein said action was pending and tried, found the issues herein for the defendants, to which finding said plaintiff excepted and moved for a new trial in the said cause, which motion was by said court over-

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ruled, and thereupon said court rendered judgment against said plaintiff and in favor of said defendant for costs. And inasmuch as the matters and things do not appear of record, he tenders this as his bill of exceptions herein, and prays that the same may be signed and sealed and made part of the record in this case.

GARNSEY & KNOX,

*Attorneys for Plaintiff.*

G. D. A. PARKS,

*Attorney for Defendant.*

Certificate of trial judge.

6067 Here follows map shown on opposite page.

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ABSTRACT OF APPELLATE COURT RECORD.

6068 3 Order entered in vacation April 6, A. D. 1881, finding the facts in the case from the evidence.

4 The facts as found by the Appellate Court are set forth from pages 4 to 17 inclusive, and are simply a repetition of the agreed state of facts set forth in the bill of exceptions appearing in the abstract of the transcript of record from the Circuit Court.

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19 Opinion of Appellate Court, filed April 6, 1881, from page 18 to page 30 inclusive, recapitulates the facts as found by the Appellate Court, being the same as those agreed upon in the Circuit Court.

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## OPINION OF APPELLATE COURT.

Reported in 8 Ill. App., 72.

6082 The judgment of the court below reversed and judgment entered in this court in favor of the plaintiff below and against the defendants below for \$800 and costs of this court.

Judgment accordingly.

47 Order granting appeal to the Supreme Court.  
Appeal allowed for reasons set forth in order.

53 Certificate of clerk of Appellate Court.

6085 Assignment of errors.

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## BRIEF FOR APPELLEES IN APPELLATE COURT.

The record presents the following as the principal points for consideration:

*First.* Viewing the State and Adam, in the relation of upper and lower riparian proprietors on the Desplaines river, is the State guilty of a *diversion*, if it takes out above Adam's Dam no more water than it brings in from Lake Michigan through its own canal?

*Second.* Even if the State itself be supposed guilty of a diversion by the act of passing the water from the pool above Dam No. 2 down to the Channahon level on which the oat mill of the appellees is situated, and where it can by no possibility again become available to the appellant, whatever use is made of it, can the appellees Slater & Druly be sued as the responsible agents in the act of diversion, which is thus already

(2)

irrevocably consummated by operations at the lock and dam above?

6088 *Third.* Adam having purchased subject to the release executed by his grantors in 1853, does that release operate to bar the action?

The first, as the court at once perceives is the principal question, and to that I shall devote my chief attention, the interest of both parties being to test the absolute discretionary right claimed by the Canal Commissioners, to lease the surplus water at Joliet, derived from Lake

Michigan, through the deep cut, in such modes as they find most profitable to the revenues of the canal.

## I.

### THE CASE SHOWS NO DIVERSION BY THE STATE.

The topographical features of the case are so clearly exhibited by the map accompanying the record, that I shall without further explanation assume the court to be cognizant of the relative localities involved in the controversy. The facts also that counsel on both sides deem essential to present the main point on which the decision of the court is desired, are brought within a very narrow compass by the agreed case. Nothing is left, therefore, but a question of law: If the water, which is the subject of the alleged diversion, is conveyed into the canal from Lake Michigan through the works and at the expense of the State, and constitutes no part of the natural and customary flow of the Desplaines river, can it be rightfully withdrawn again by the State on its own premises, if in doing so that natural and customary flow of the river is not diminished?

Perhaps the theory on which the appellees rely may be

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stated in the simplest and most convenient terms by casting the prominent facts into the form of a hypothetical case.

Let A. (the State) and B. (Adam) be upper and lower riparian proprietors on a given natural water course (the Desplaines river), which I designate as water course No. 1.

A., the upper riparian proprietor, happens to own or control another and entirely independent stream which we will designate as stream No. 2 (Lake Michigan) the waters of which, for certain purposes of his own, he desires to transmit beyond the channel of No. 1, by some suitable artificial structures, the particular method chosen being a question of judicious and economical engineering, adapted to the local conditions of the case.

The method which A in fact adopts is this: instead of crossing *directly* at the point where No. 1 is introduced into No. 2 he finds it expedient to cross at a point on his premises lower down, employing the channel of No.

1, for this distance as a temporary conduit for conveying the water of No. 2, to its destined exit, and then, by proper structures discharging this extra water into a channel of his own on the other side, prepared for it.

By this process the waters of the two streams are of course necessarily mingled together while thus flowing as an agent for the production of mechanical power and the rights of the parties in the division admit of certain adjustment on the basis of *equivalent quantities*.

(4)

Let us further suppose that B, the lower riparian owner on No. 1, not only receives a full equivalent for his dues in the original flow, but *a much larger amount*, incidentally supplied from No. 2 in the course of the operation.

*Question:* By thus withdrawing from No. 1, the water which he has temporarily added to it is *A guilty of a diversion?*

A plain statement of the questions suffices to solve it. I am certainly but expressing what seems to be a self-evident proposition of natural justice when I say that A has a perfect right as against B to deduct from water course No. 1, by artificial channels the same amount of water which he conducts into it by artificial channels from No. 2 unless that right has been qualified by contract or prescription, which is not pretended in the case at bar.

This proposition I do not hesitate to affirm is an inevitable inference from the elementary principles, governing the relations between riparian owners.

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# 6106 THE CREATION OF WATER POWER WAS ONE OF THE OBJECTS CONTEMPLATED IN THE ORIGINAL PLAN OF THE CANAL.

An attempt is made by appellant's counsel, though it must be admitted not a very serious one, to show by referring to the several acts of the Legislature, under which the Deep Cut was finally completed, that the water thus obtained is not *bona fide*, genuine, legal canal water below the terminus of the Summit level.

Now, it is a matter of public history well known to the court, that the original plan of the canal was to supply the Summit level from Lake Michigan, precisely as

it is now supplied. Much of the work, in fact, has been done before the suspension of 1840. When the enterprise was resumed in 1845 under the trust created to secure the bondholders, the then embarrassed financial condition of the State compelled a temporary relinquishment of the original plan, and the substitution

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6107 of what was termed the raised or shallow cut, to be supplied by pumps at Bridgeport and the Calumet feeder. In 1865 the City of Chicago found itself compelled to face the stupendous problem of drainage, for the public health and comfort, and deeming that its object could be effectually accomplished by completing the old deep cut already partially excavated, asked permission of the State to finish the work. Permission was given by the Act of 16th of April, 1865, entitled: "*An Act to provide for the completion of the I. & M. C. upon the plan adopted by the State in 1836.*" Besides this significant title the preamble to the act contains a brief reference to the past history of the improvement,—the original plan,—its abandonment "for the time being"—the precarious and unsatisfactory nature of the mode of supply from the Calumet feeder and hydraulic works at Bridgeport, and the great benefit to be expected by deepening the cut.

See Public Laws, 1865, p. 83-4.

The work accordingly was undertaken and was completed in 1871, at an expense of several million dollars, and the cost soon after refunded to the City of Chicago by the State.

It is necessary to argue the point which counsel suggest, based on the special circumstances that led to the improvement? Is it not enough that the improvement was in fact made? Is not the condition of the case essentially the same as if the work had been done in the first instance by the State instead of by the City of Chicago, and done in 1848 instead of 1871?

#### 6108 RIGHT OF THE CANAL COMMISSIONERS TO CREATE AND LEASE WATER POWER.

But again, the counsel for appellant express a gloomy apprehension that it is hardly according to law for the

Canal Commissioners to create and lease water power to help support

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the canal. To sustain this view they have ransacked the canal laws *ab initio*, not forgetting the act of Congress of 1823.

To this somewhat odd position I reply:

1. That while navigation is the primary object of a canal, yet to create water power as an incident has been the universal policy of such enterprises when undertaken at the public expense or by private corporation. The disposal of the water control of the state, and the public good dictates, both that it should be utilized in aid of manufacturing interests, and that it should be made to contribute to the expense of maintaining the work. Such, at all events, has been the established policy on the Illinois and Michigan Canal, unquestioned for more than thirty years. No express statute indeed was required to make it a duty of the Canal Commissioners, in the vigilant fulfillment of their public trust, to thus add to their limited revenues, wherever they found it practicable. The details of administration in respect to this branch of their official duties, of course, are necessarily confided to their own judgment and discretion. Special occasions have arisen and may again arise for special  
6109 legislative regulation on the subject, but the particular methods of creating and delivering power at any given place is a question for the Commissioners under the advice of their Chief Engineer.

2. The statute expressly gives them a general authority to lease water power.

R. St. (1874), p. 189.

The expression, 'and lands and lots connected therewith,' cannot well be construed as intended to exclude cases where the state happened to own no lands or lots adjoining the *locus* of the waterfall. Ordinarily such a connection would exist, but it would not where the site occurs on a school section, as here, or on Government lands. But unless the two subjects

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enumerated in the clause 'water power' and 'lots' are from their nature indissolubly conjoined together, they are to be taken distributively. We are to look at the

main leading design of the law; and that was to utilize the surplus water for the benefit of the state wherever possible.

3. But lastly the question is none of the appellant's business. If he is legally entitled to the water, the point is needless,—if he is not, its use by the Commissioners. is no concern of his.

#### IS THE WATER ABANDONED AT LOCKPORT?

6110 It is contended, on the other side, that admitting the general principle under which we insist on the right of the state to draw out above the appellant's dam the water derived from Lake Michigan, yet it has no bearing on this case, for the reason that it applies only where he who asserts it is riparian owner continuously for the whole distance, including both the point where the extra water is introduced and the point where it is withdrawn; that here the state appears to own no land upon either bank of the Desplaines river between Lockport and its junction with the canal above Dam No. 1, and that the water being thus allowed to run into a foreign water course at a point where the state has no *status* as a riparian owner, it must therefore, be deemed to have been abandoned and incorporated for all subsequent legal purposes with the proper water of the river.

To this argument I reply that it somewhat misconceives the facts, and would be untenable if its facts were true.

The record shows that the Desplaines river was appropriated to the use of the canal as a *feeder* in the very beginning of the enterprise nearly fifty years ago. The appellant's grantors describe it as a feeder in their release. It has been

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6111 so constantly used for more than thirty years. By what proceedings it was originally condemned or appropriated to public use and the rights of riparian owners subjected to this important easement does not appear, nor is it necessary now to inquire; for it has at any rate become perfect by *prescription*.

The state then by virtue of this easement has complete jurisdiction over the current and channel of the river,



for the general purpose of a feeder; as much so as if it were the riparian owner from headspring to mouth.

If it be said that this easement as a feeder is confined to the natural flow of the stream, and does not extend to its use for conveying water obtained from other sources, I reply that this mode of use has also been settled by prescription. Before the deep cut was finished, for more than twenty years before the surplus water from the Summit level, used at the mills at Lockport, had been conveyed to the lower level through the medium of this feeder.

And finally, the map before the court indicates that such a use must have been contemplated when the easement was first acquired. The juxtaposition of the Hydraulic Basin to the river, and the necessary use of its channel as a vehicle to receive and convey the water thence, demonstrate that this was a part of its intended purposes when originally appropriated as a feeder.

#### THE INTENTION OF THE STATE.

On the point under consideration, the first inquiry will be, I apprehend, what was the intention of the state? For it will be hard to maintain that a thing is effectually which the owner evidently intends to resume and control  
6112 for future use. To "abandon," in the sense in which the term is here employed is to relinquish all future claim of property, or

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exclusive use, and to give it finality, wholly and absolutely to the public. But that confessedly is not true, in this case, in point of fact.

The whole plan of the canal is to be treated as a *unit* like a vast machine, and to be viewed all together; each part in its relation to every other part, however remote. The entire chain or system of structures composing the canal, from terminus to terminus, must be surveyed, moreover, in relation to the physical peculiarities of the region through which it passes; for the engineer is planning such a work must necessarily conform and adapt it to the contiguous country.

The relative course and comparative levels of the river and canal between Lockport and Joliet are clearly indicated on the map which the court has before it. These

local conditions, it will be perceived are such that the surplus water discharged at Lockport, through Norton & Co.'s tailrace and through the waste wier, pursues the channel of the river for a distance of about three miles, and then empties again into the canal between Lock No. 4 and Dam No. 1.

6113 Now, how have the legal attributes of this water, with reference to the rights of the appellant been essentially changed? The plan of the canal as to the disposition of the surplus water, obviously contemplated this very mode of transmission from one level to another. The total fall between Lockport and Joliet is about sixty feet; and in that part of the canal which concerns this case, it will be seen, there are seven successive levels: 1st, the summit level; 2d, that between locks 1 and 2; 3d, between locks 2 and 3; 4th, between locks 3 and 4; 5th, between lock 4 and Dam No. 1; 6th, between Dams 1 and 2; 7th, the Channahon level.

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Into the Summit level Lake Michigan, by the recent improvement, supplies, as was contemplated in 1836, a large quantity of surplus water, estimated at about 25,000 cubic feet per minute, not needed for navigation, but very valuable to the State of Illinois and the manufacturing interests of Lockport and Joliet, for hydraulic purposes.

The plan of the canal within this distance affords four falls available to the state for water power—one at Lockport, leased to Norton & Co.; one at Dam No. 1, one at Dam No. 2, and one at Channahon level, a portion of which is leased to the defendants. Thus the same volume of water is repeatedly used on successive levels within a space of about four miles.

Recently the Canal Commissioners found that the surplus water at their disposal from the level above Dam No. 2, was such that after leasing all that could be leased to advantage at the dam, and after transmitting to the appellant more than double the amount he was accustomed to receive through his own pitiful stream before the deepening of the cut, there was still a large surplus that could be utilized most profitably, by the state, in the method exemplified in the case at bar, viz: by drawing it directly through openings from the canal itself, and then discharging into the river, but necessarily and unavoidably below the plaintiff's dam.

Thus it is apparent that no *intention* to finally abandon the water at Lockport can be inferred from the original design of the canal; and no such purpose, in fact is or can be imputed to the official agents of the state at any time. If an abandonment has occurred, it must be an involuntary one by the subtle operation of the mysterious technical rule of law, upon the bare fact that the surplus water instead of being transferred from one level to another between the banks of the canal itself, or through a race alongside constructed by the

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state, or through some ravine or natural depression in the ground owned or controlled by the state, is left to descend by the law of gravity through another kind of channel lying convenient for the purpose, to wit: the bed and banks of the Desplaines river, a water course already appropriated to the use of the canal as a feeder.

Is this an abandonment in any sense whatever?

- 6115 Let it be remembered there is no question here between the state and the riparian owners on the river between Lockport and Joliet. To them individually this influx of water from the canal may be a benefit or an injury according to the use they happen to make of their land. But whether a benefit or an injury, they assuredly have and claim to have no concern with the water after it again joins the canal, nor any joint interest with the riparian owners below the point of junction. The same thing must be true of them, as to all the riparian owners above.

As to *them*, it cannot be affirmed, for there can be no legal occasion to affirm, that ~~this~~ additional water is a part of the customary flow of the river, considered as a whole. And if not as to them, how can it be so described and claimed by a lower proprietor? It is *their* part of the channel and their part only which the state has been thus using uninterruptedly for now more than thirty years, as a convenient conduit to transmit the surplus water of the canal from the hydraulic basin in Lockport to the upper basin, as it is commonly called, in Joliet. If a detriment to them, they have not complained; if an advantage they have no reason to complain. They can be presumed to claim no right in the water, except this, that while passing through their possessions in its transit from one point to another of the canal, for ulterior use

by the state, they as an incidental necessity of the case, may and must enjoy the advantages of it.

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6116 And between themselves, doubtless, while the water is thus suffered to run, each lower proprietor as against those above him has a right to demand for himself the full, unobstructed enjoyment of the improved flow. But whatever the relation between the state and them or between themselves, these relations cannot rationally extend to effect one way or the other those above or below them.

The proposition of the counsel on the other side, then, is at last cut down to this:—that if A, in the process of transmitting the water of No. 2 from one side to the other of No. 1, compelled for a part of the way to use or does use a part of the channel of No. 1, which does not happen to belong to him as riparian proprietor, then and in that case, whatever his intentions the instant the water is poured into that portion of the channel; he can no longer pursue his exclusive claim to it and utterly loses his right to transmit it across for his own use on the other side. By force of some metaphysical principle of law, it becomes indissolubly annexed to No. 1, as a part of its “natural, customary and ordinary” flow, and B, and not only B, but C, D and E down to the very mouth of the stream, though contributing nothing to the expense of construction, repairs or operation, and though, not only not injured but in fact greatly benefited by its operation, as in this case, can come into a court of justice, and, thanking A for nothing, claim the water he has been at so much trouble to secure, as their own.

6117 On what principle of justice, intelligible to a judge, can such a claim be set up? In this age, courts, while strictly observing the mandates of positive law and adhering to established precedents, are not accustomed to favor technical notions tending to defeat manifest right; and the law of water courses, forms no exception in our jurisprudence.

This court, we think, will say to the appellant, what difference does it make to you, whether the land bordering on

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the river, in Secs. 22, 23 and 27, in the Town of Lockport, and Sec. 3, in the Town of Joliet, belongs to the State or

to individual proprietors? If the state owned the land, or had express permission from the owners to thus use their portion of the bed and banks of the river as a convenient conduit to convey the water of its canal from one point to another, you hardly pretend that you would have any reason to complain. What better reason have you, if without any formal grant, these owners have now for more than thirty years acquiesced in such a use without objection and without asserting against the state any adverse rights for themselves, by reason of it; or, if so, certainly without asserting any which concern you or were for your benefit, or have any possible regard to your interests?

6118 The fact, then, that this link of communication between the hydraulic basin, at Lockport, and the upper basin, in Joliet, into which the river discharges as a feeder, does not belong to the state is, I submit, quite immaterial to the argument. It is a circumstance affecting only and exclusively the relations between these particular intermediate owners and the state. In fact, for fully two-thirds of the way, as will be seen, the river runs through canal lands, which must be supposed to have been sold subject to the right of the state to the use of the channel. But those also who purchased from the Government of the U. S. must have done so after the plan of the canal connecting with the Desplaines river as a feeder was adopted, and with full knowledge of and reference to it.

If ever there was a case of prescriptive right, here certainly we find a right by prescription in the state to employ this section of the river channel as a connecting link between the two canal levels, for the purpose of transmitting the surplus water from one to the other.

It is a case strongly reminding us of the language employed in a decision already quoted: "It would be a harsh rule to require those engaged in these enterprises to construct

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an artificial ditch along the whole route through which the water was to be carried, and to refuse them the *economy that nature occasionally affords* in the shape of a dry ravine, gulch or canyon?"

6119 Without pursuing this head of the argument further, the counsel for appellees respectfully submits the following propositions as maintained:

1. That the appellant is only entitled as against the state to the natural and customary flow of the Desplaines river; and can only complain of a diversion in respect thereto.

2. That the surplus water derived from Lake Michigan, in 1871, is in no sense a part of this natural and customary flow, unless that character is impressed upon it by the circumstances that between the hydraulic basin at Lockport and the upper basin at Joliet, it is conveyed in the channel of the river, running by the side of the canal, and employed as a convenient conduit provided by nature, and presumably with the consent of the riparian owners.

3. That this accidental circumstance does not change the rights of the state in the water as the proper surplus water of the canal, because there was no *intention* to abandon its use, in the sense of any of the adjudged cases cited to support that position; but, on the contrary, a manifest intention to resume it for further canal use.

6120 4. That the peculiar occasion on which the City of Chicago undertook to finish the canal according to its original plan, in no way affects the rights of the state in the ownership and control of the surplus water furnished by the deep cut.

5. That the general policy of canal administration, as well as the canal laws of Illinois, contemplate and require the leasing of water power, wherever it can be profitably developed as a source of revenue, whether with or without accompanying

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water lots. Hence, we contend there has been no diversion from the plaintiff by the state.

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## II.

THERE IS NO RIGHT OF ACTION AGAINST THE APPELLEES.

This branch of defense, although inferior in public interest to the proceeding, is met in the record and cannot be passed over without notice.

The suit evidently is an attempt to escape the constitutional provision which prohibits the suing of the state, and also the statute which extends the same exemption to the Canal Commissioners.

R. St. Ch. 19, §3.

It has thus been declared the public policy of Illinois, that in controversies of this sort, between the state and individuals, if wrong has been done under the authority of the state, resort shall be had to the Legislature for relief. The appellant deemed this remedy rather unpromising and so has sued the lessees of the state, Slater & Druly. We think the action must fail for two reasons—one that the act of diversion was not committed by the appellees, and the other, that it is against public policy.

1. There has been no diversion by the appellees. The case shows that none was possible.

Abst., p. 1, Rec., 3.

The oat mill of the defendants is situated on the berm bank of the canal, about three-fourths of a mile below Dam No. 2; at which dam the water, that is not suffered  
6122 to flow into the channel of the river and thence down to appellant's mills, is discharged into the Channahon level through the lock and a

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bulkhead, constructed for the purpose.

At this point the canal has entirely completed its crossing of the Desplaines river and from thence onward diverges into a separate and independent channel.

The instant the water leaves the pool of the dam and descends into the Channahon level it becomes forever detached from all relations of riparian rights with the river and the mill and dam of the plaintiff.

When it reaches a point opposite the defendant's mill, it can no more be identified or recognized as river water than at a point ten miles below or at Ottawa or La Salle. It is *pure* canal water, in a legal, though, it must be confessed, in no other sense.

The act of *diversion*, therefore, as an actionable injury, takes place and is consummated at Dam No. 2; for the act must consist in that operation by which the water, instead of being suffered to flow over the dam into the river channel and down to Adam's wheels, is irrevocably turned off in another direction.

In this operation, conducted as it must be by the functionaries of the state, in the official administration of the affairs of the canal, the defendants, of course, have and can have no responsible agency. The stage of water  
6123 in the Channahon level from time to time, and the



methods of supplying it, are matters of exclusive official regulation.

The water being by this process already diverted, Adam, as a riparian proprietor, has no further concern with it. In its mere character as a physical substance he sets up no right to it in this suit; and he can assert no *usufructuary* right, except where it is found existing under such local relations to his mill, that *he* himself, could use it as motive power, if the appellees did not. But it is obvious that when the water has

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reached down to a point opposite their mill, it can be of no *benefit* to him in any possible event, and *e converso*, it can be no *injury* to him, if it is used by others. If, then, their use of it is no legal *injury* to him, how can it be denominated a diversion?

It seems too plain for serious dispute that the act of diversion, if any, is performed at the point where the road forks, so to speak, and is effected by the sole agency of the officers of the state, in the performance of their public duties.

If the place of the defendant's headgate, relatively to the plaintiff's mill was such, that, if not used by them, the water could be conceived as in some way available to *him*, the case would be very different. But such is not their relative position, as the agreed case and accompanying map clearly demonstrate.

6124 The appellant's only interest in the water, I repeat, is that of *user* for hydraulic purposes at his mill, and so the declaration expressly describes it. He asserts no right to it otherwise; and this usufructuary interest is only supposable under conditions which make it possible for *him* to use it. After it has passed down and out from these conditions, and is found in some place entirely beyond their range, it is altogether disconnected from the system of riparian rights pertaining to the Desplaines river.

2. The action was brought in evasion of our express and established public policy, in respect to controversies with the state, arising from the management of the canal by her official agents.

R. St., cited *supra*.

It is very distinctly a case coming within the reason

and spirit of this wise policy of the Government. Confessedly, it is

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a dispute between William Adam and the State of Illinois, involving the control, at Joliet, of the immense volume of surplus water which pours down from Lake Michigan through the deep cut. If Adam has been aggrieved, the state should pay the damage; and this constitutional and statutory provision, while thus taking the rights and liabilities of the State out of the jurisdiction of her judicial tribunals, contemplate that her Legislature will do him ample justice. To that resort, however inconvenient, he is confined.

- 6125 If the Canal Commissioners, who made the lease to the appellees, as the official agents and representatives of the state, cannot be sued, would the court tolerate a suit against the executive officers in charge of the canal, say the superintendent or the locktender, for faithfully carrying out the orders of the Board? If the principal officer is protected, in the disposition of the surplus water from litigation, will not his subordinates and employes also be protected? There can be no doubt of it, since otherwise the whole object of this public policy of the state would be practically defeated.

In analogous questions arising from the acts of ministerial officers in executing process, the rule is universal, that what is a justification of the principal officer will also justify his deputies and assistants.

2 Hilliard on Torts, p. 156.

The same principle of immunity extends to all officers acting for the state.

*Gidley v. Pulmerston*, 7 E. C. L., 438.

*Hodgson v. Dexter*, 1 Cranch., 345.

The consequence is, that, inasmuch as the diversion of the water by the officers of the state is by express statute declared

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- 6126 to be not an actionable injury as to the state or her officers who may commit it, the lessees from the state, who, if sued at all, must be sued in the character of joint tortfeasors with the commissioners, must and should share the like immunity. If the supposed cause of action is not a tort, but a claim against the state to be adjusted by

the General Assembly, then Slater & Druly, it would seem, cannot be joint tort feorsors.

### III.

#### THE PLFF'S CLAIM BARRED BY THE HAVENS' RELEASE.

A certain release from Adam's grantors, Haven & Haven, was put in evidence on the trial (Abst., 6), though not very strenuously pressed in defense, which, it was hoped, was invincible on other grounds. Nor is it now pressed strenuously; for, if either of the two preceding propositions shall receive the assent of the court, the point of the release becomes one of little or no practical importance. A few words, therefore, upon it, will suffice.

In the plan of the canal, the Desplaines river had been taken as a feeder at a point above the Havens' mill. In 1848, by an appropriate legal proceeding, the Havens claimed damages for diversion.

*Canal Trustees v. Haven*, 5 Gil., 548.

After considerable litigation, the case was finally compromised, and the release in question executed for a consideration of \$3,060.

On the trial of this cause in the court below, it was urged against the release, when interposed as a bar to the suit by Adam, a grantee from the releasors, that it only gave to the Canal Trustees and the state the right to

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use the water of the river strictly for the purposes of *navigation*, as contradistinguished from water power.

6127 But is it certain that this restricted construction is the true one? The intention of the parties is to be gathered from the whole instrument, the surrounding circumstances, and the nature of the subject matter.

By these lights is it not more fair to suppose, that the real, substantial design was to release to the trustees the rights of the Havens in the entire flow of the stream for *general canal purposes*? True, that in one place the expression "for the purpose of navigation" is employed. But immediately following we find these other words—"in the same manner the water in said river in connection *with other feeders* is now used for supplying said

canal." Was it not the leading idea, that it was to be turned over to the trustees to be used as a feeder, just like any other *feeder* supplying the canal?

6128 The principal purpose of every canal, no doubt is navigation; and water power is only an incident. Hence, in an instrument of grant or release, the principal object might and naturally would be named, without, however, necessarily raising the presumption that it was meant to exclude that which was usually connected with it as an incident. If in this case the Desplaines in 1853 had a capacity to fully supply the wants of navigation, and a surplus besides, perhaps a doubt might arise whether the grantors did not intend to restrict their grant to the quantity required for the specific object of navigation. But in truth the Desplaines *per se* was and is a most insignificant stream, a mere rill in the summer season. There was no time when the state could not for navigation purpose command the whole volume of its discharge. Nor was the state under any obligation to maintain any other particular feeder, either the Calumet or the pumps. Its discretionary power to construct and alter its own works

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could not have been intended to be tied up in that way. The instrument cannot be construed as importing a binding condition, that the state should continue forever the particular system of supply then happening to exist, if it should be found expedient afterwards to change it for the public interest.

And, if such was the true construction, it would not much help the appellant. It certainly was an incidental object of "the other feeders" to which this feeder was assimilated, to furnish water for hydraulic purposes as well as for navigation purposes.

If, then, the Desplaines was placed on the same footing with the other feeders and made to subserve the same general objects, how can the construction suggested be upheld?

In conclusion of the whole case, it is now respectfully submitted to the court that the following propositions have been maintained on the part of the appellees:

*First.* That the Canal Commissioners have not been guilty of diverting any water, to which the appellant was

6129 entitled as a lower riparian owner on the banks of the Desplaines river.

*Second.* That there has at all events been no diversion by the appellees, justifying an action against them.

*Third.* That if there has been a diversion from the customary and natural flow of the Desplaines river, such case was authorized by the Havens' release.

G. D. A. PARKS,  
*Atty. for Appellees.*

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IN THE SUPREME COURT OF ILLINOIS,

NORTHERN GRAND DIVISION,

September Term, A. D. 1881.

Wm. M. Druley, <i>Appellant,</i> <i>vs.</i> William Adam, <i>Appellee.</i>	}	Appeal from the Appellate Court of the Second District.
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## BRIEF AND ARGUMENT FOR APPELLANT.

### SYNOPSIS OF THE CASE.

This was an action in the common form brought in the Will Circuit Court by Adam, the appellee, against Druley, the appellant, and one Slater for a diversion of the water of the Desplaines river from the plaintiff's mill. Judgment having been rendered for the defendants, by the Circuit Court, to which the cause had been submitted for trial, without a jury, an appeal was taken to the Appellate Court; and, as the substantial facts were not disputed, they were embodied by stipulation of counsel in an agreed case. By this it will appear, that the main defense set up was two-fold, 1st, that there had been no diversion of the proper waters of the Desplaines river to which the riparian rights of the plaintiff related; 2d, that if there had been such diversion, yet, the act effecting it was not in any natural

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or legal sense the act of the defendants; but was exclu-

sively the act of their lessor, the State of Illinois, done by her official agents, in the regular and authoritative administration of the business of the canal.

The Appellate Court having reversed the judgment of the court below, and rendered a judgment for damages against the defendants, the case has been brought here upon a certificate of the judges in due form, setting forth specifically the questions of law involved, and declaring, that they are of such importance, as that they should be passed upon by this tribunal of last resort.

The principal facts of the case are these:—The Illinois and Michigan Canal crosses the Desplaines river at Joliet. This crossing is effected, as the map attached to the record indicates, by passing the unappropriated waters of the river, mingled with those of the canal through two basins, for a distance of about a mile, and at last discharging them again into the natural channel, over the lower dam, designated as Dam No. 2. Adam's mill is situated on the east bank of the river, about a third of a mile below this dam.

6133 When the canal leaves the river at Dam No. 2, it pursues a southwesterly direction, diverging gradually more and more from the river, this being known as the Channahon level. On this level, and about half a mile below Adam's mill dam, the defendants in 1878 erected an oat mill on the berm or westerly bank. The Canal Commissioners had discovered, that by simple and not very expensive structures, a valuable water power, promising to yield a considerable addition to the revenues of the canal, might be developed in this quarter of the town of Joliet; and accordingly made to Slater & Druly a ten years' lease of sufficient water to run their mill, under which leave the defendants proceeded to put their enterprise into operation. Their establishment is situated nearly a mile below Dam No. 2, where the river and canal part company. It is

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for this water, thus drawn from the canal, at a point far below the plaintiff's mill, and far below Dam No. 2, that the action was brought against them as lessees of the state; Adam not choosing to make his contest directly with the state herself.

It has never been, and of course cannot be pretended that the surplus water in question is to be described as

any part of the natural and customary flow of the Desplaines river; if by that expression is meant the flow derived from its natural source and affluents in the watershed which it drains. The Desplaines is in truth a very insignificant stream, never of much use as a feeder in the season when its services are most needed, and, except as reinforced by contributions from the canal, affording sites only, for what are sometimes denominated  
6134 "thunder shower mills."

In 1871, when the summit level from Chicago to Lockport was finished on the original Deep Cut plan, which the pecuniary embarrassments of the state had for so many years suspended, drawing its supply directly from Lake Michigan, as the fountain head, the Canal Commissioners found themselves in possession on the summit level of a vast surplus of water, tenfold beyond what was required for navigation. The question then met them, how they could best utilize it for the canal revenues and the public good?

From Lockport to Joliet there is a fall of about fifty feet, divided into five levels. If, as we must for the present venture to assume, although questioned by the Appellate Court, this surplus water rightfully belonged to the canal and was subject to the control of its officers for all legitimate canal purposes, it was manifestly the duty of the Commissioners to make the most profitable disposition of it, possible under the circumstances. If susceptible of repeated use, it seemed to be as manifestly their duty to avail themselves to the utmost of this accidental advantage. How was this to be done? How were they to preserve for repeated use at successive falls the pro-

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prietary rights of the state in the water? It could not, at least but a small portion of it could be conveyed through the channel of the canal itself from Lockport to Joliet. To excavate or construct another channel by its side as a  
6135 sort of race or conduit for that sole purpose would be absurd. Nature, however, it was seen, had provided a convenient medium in the channel of the Desplaines river just alongside; and by this, the surplus passing through the spillways and mills at Lockport, could be, as it always had been, transmitted, till it again reached the canal, in what is called the "upper basin" above Dam



No. 1. No question has ever been made in regard to the local rights pertaining to this body of water, as between the state and any other interests concerned in it, till we come to Dam No. 2. Here the battle begins. At this point the Canal Commissioners assert the right of the state to pass this immense volume of water received into the summit level from the lake, or so much of it as they find profitable to their revenues, into the level below, instead of allowing it to flow over the dam into the channel of the river, for the plaintiff's benefit.

The main issue thus becomes apparent to the court. Does this surplus water belong to the State of Illinois or to the appellee? Is it in any sense to be recognized under the circumstances of the case, as a part of the *customary* flow of the Desplaines river?

6136 Treating the state and Adam as occupying substantially the mutual relation of upper and lower riparian owners on the river, is the state, as the upper owner, entitled to take out again what it has brought in, from Lake Michigan by this recent improvement? By using the Desplaines as a conduit for a part of the way, has the state, in relation to this lower riparian owner, irretrievably lost its proprietary rights in this volume of water, thus conveyed to Lockport through its own works from its own reservoir? Viewing the canal from Chicago to Joliet as one connected system of structures de-

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signed for the conveyance and disposition of the water derived from the lake, and considering it as a necessary consequence of that plan, that the water discharged at Lockport should be again restored to the canal in the upper basin, can the official agents of the state by the fact of employing this convenience of transmission from one level to another, be supposed to have *abandoned* this valuable surplus, with respect to any proposed future exclusive use of it? If it be conceded, as it must, that there was no real *intention* on the part of the canal officers to relinquish the proprietary rights of the state in the future disposition of the water, does such a result follow, nevertheless, from the circumstance, that for a part of the way, the state, instead of having drawn the water continuously through the canal or through some other channel, of which she is sole proprietor, has seen fit to avail herself of an obvious "economy of nature," as a

6137 California judge expresses it; and suffered it to flow for a short distance through the channel of the river?

These are the questions of greatest interest in the case; yet there are others embraced in the certificate of the Appellate Court which will demand attention.

It was argued in both the Circuit and Appellate Courts, on behalf of the defendants, and will be again insisted on here, that after the water had passed down into the Channahon level, and was found under such local conditions in relation to the plaintiff's dam, that *he* could by no possibility use it to propel his machinery, it was as much detached from the system of riparian rights appertaining to the Desplaines river, as if it had reached the very *terminus* of the Channahon level, ten miles below, or Morris or Ottawa. This being so, the act of the defendants in making use of water found opposite their headgates, which had already flowed down below the plaintiff's dam, and thus found there by no responsible agency of theirs, could be no actionable diversion on their part; and the cause of complaint if

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any, was exclusively against the state or the Canal Commissioners.

There are still other points, to which the opinion of the Appellate Court has challenged the earnest attention of counsel; but which are not deemed necessary to now introduce to the notice of this court in this short preliminary view.

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## BRIEF.

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### I.

#### NO DIVERSION BY THE STATE.

No diversion can be charged against the state; because, the surplus water in question is to be regarded as the proper water of the Illinois and Michigan Canal, and in no sense a part of the water "*accustomed*" to flow in the Desplaines river, on which the appellee, William Adam, is a riparian proprietor.

1st. A lower riparian owner, on a natural water course, is entitled and only entitled to receive, from the proprietor above the PROPER, NATURAL AND CUSTOMARY flow

of the stream, unimpaired in quantity and in the conditions of fall necessary to make it reasonably useful to him.

Ang. on Water Courses, Sec. 95, *et seq.*

*Plumleigh v. Dawson*, 1 Gil., 544.

*Evans v. Merriweather*, 3 Scam., 492.

This doctrine is expressed in the maxim of the civil law, "*aqua currit et debet currere, ut currere solebat.*"

*Belknap v. Belknap*, 2 Johns. Ch., 463.

- 6139 2d. The proper, natural and customary flow of water in a natural water course must be defined in general terms, as that

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body of water which issues from its natural sources and affluents, in the watershed that it drains.

Ang. W. C., Sec. 4, *et seq.*

3d. If an upper proprietor A, increases the volume of water by artificial means, from a reservoir of his own, as in the case at bar, and permits it to pass unreclaimed, below his own limits, then, as between the lower proprietors B & C, C may justly insist, that he is entitled to the benefit of the increased flow, and that B ought not to divert it from him.

Ang. W. C., Sec. 95.

4th. A riparian proprietor, owning on both sides of the stream, is to be deemed the perfect and absolute owner of its bed, banks and channel, subject only to the right (familiarily if not with strict propriety termed an *easement*), in favor of his neighbors below; that although he may make use of the water *ad libitum* and even alter wholly the course, dimensions and character of the channel within his own limits, he shall at last deliver to the servient proprietor unimpaired the natural flow which he had received from those above him. This is stating the rule in somewhat stronger terms than is strictly correct, but still with sufficient accuracy for our present purpose.

- 6140 Ang. W. C., Sec. 5.

*Buckingham v. Smith*, 10 Ohio, 288.

*Trustees, &c., v. Dickinson*, 9 Cush., 547.

*Brace v. Yale*, 10 Allen, 443.

2 Bouvier's Institutes, 174.

5th. The rights of the power proprietor, B, being thus confined to the customary, proper and natural flow of the

stream, derived from its head springs and affluents, he has no legal concern, not the least, in the use which A may choose to make of his own section of the channel. This proposition can hardly be stated too broadly. And on the same principle it

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also follows, where the case is not affected by prescription, contract, or other special conditions, that if A, for his own private purposes, conducts water into the stream from an exterior source, to which B is a stranger, he, (A), may again deduct an equivalent quantity, provided in doing so he does not interfere with the rights of B; and provided also, he has done nothing, and suffered nothing to take place, amounting to an *effectual* abandonment to public use.

*Whittier v. Cacheco Mfg. Co.*, 9 N. H., 454.

*Soc'y for Mf'g. v. Morris Canal Co.*, Saxton (N. J.), 157.

*Butte v. Vaughn*, 11 Cal., 143.

*Burnett v. Whitesides*, 15 Cal., 35.

6141 *Elliott v. Fitchburg R. R. Co.*, 10 Cush., 191.

*Embury v. Owen*, 6 Exch., 360.

2d Washburne on Real Property, 329.

*Hoffman et al. v. Stone et al.*, 7 Cal., 46.

6th. The water discharged at Lockport from the tail-race of Norton's Mills, and the spill way, is in no legal sense *abandoned*, nor the right of the state to its future use relinquished, by reason of the fact, that it happens to pass from one level to another through a medium exterior to the prism of the canal, instead of directly between its walls, or through some other channel exclusively owned by the state. It is sufficient, that it in fact *does* rejoin the canal and *does* return to a condition of *statu quo*, long before reaching the dividing line between the state and Adam; and it is of no practical or legal concern to *him*, what may have been the particular mode or conditions of transmission at some remote stage in its passage.

*Hoffman et al. v. Stone et al.*, 7 Cal., 46.

*Butte v. Vaughn*, 11 Cal., 143.

7th. The water supplied to the summit level through the

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deep cut belongs to the canal, and is within the jurisdic-

tion of the commissioners, in the same sense and to the same extent, precisely, as the water found in any other of the several levels. The motive causes and history of the improvement are quite immaterial here.

- 6142 Its supposed benefit to the drainage of Chicago, as an incidental consequence of its flow into and through the canal, cannot affect its ultimate *status* as *pure* canal water, pure at least in a legal sense.

Pub. Laws, 1865, 83.

8th. It is the duty of the commissioners, as well with a view to revenue for the support of the canal, as to incidentally promote the manufacturing interests of the country traversed, to develop, husband and utilize water power to the utmost, wherever they can do so. The statute indeed expressly recognizes and enjoins this duty.

R. S., Ch. 19, Sec. 8, Clause 6.

## II.

### NO DIVERSION IMPUTABLE TO THE DEFENDANTS AS LESSEES FROM THE STATE.

If, however, a diversion could be charged against the state by this act of turning off the water in question through the bulkhead in Dam No. 2 into the Channahon level, it thereafter becomes finally separated from all connection with the Desplaines river, and from the entire system of riparian rights and duties appertaining thereto. Being thus for future purposes, indistinguishably incorporated with the proper water of the canal, and having passed under such local relations with reference to the appellee's mill, that *he* could by no possibility

- 6143 use it, to turn his own wheels, its use by Slater & Druly can

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not be described as a diverting—by them—from him—of the waters of the Desplaines river.

*Parker v. Griswold*, 17 Conn., 288.

The claim, if any there be, as against the State of Illinois, for an injury done to a private citizen by its official agents, and to be redressed, as the constitution and the laws direct, by the justice of the Legislature; since no

suit is permitted to be brought against the state or the Canal Commissioners.

Const., Art. IV, Sec. 26.

R. St., Ch. 19, Sec. 3.

If the alleged injury is not an actionable tort against the state or commissioners, from considerations of public policy, but left to legislative remedies alone, it ought not to be chargeable in law against the defendants as joint tort feorsors with the canal officers; and the present suit, as being in palpable evasion of the spirit of the statute and constitution, ought not to be sustained.

*Jermaine v. Wagner*, 1 Hill (N. Y.), 284.

Hilliard on Torts, Vol. 2, 155-255.

*Main v. McCarty*, 15 Ill., 441.

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### III.

#### THE HAVENS RELEASE.

1st. The appellee, Adam, bought subject to the perpetual release of damages executed by Philo A. and Orlando H. Haven to the canal trustees in 1853. This release was intended to confer upon the trustees a plenary and unlimited control over the Desplaines as a feeder, to the same extent as could be supposed of any other of its feeders; the releasors

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making their riparian rights entirely subordinate to the public demands.

Ang. W. C., Sec. 228.

This broad view of its import and intention is rendered probable by the consideration that even on this basis the compromise was one highly advantageous to the Havens; inasmuch as this court had recently decided, that their mill privilege was really of no value save as a sort of dog in the manger, to annoy the trustees with mere technical causes of action and barren claims for nominal damages. We specially invite the attention of the court to

*Canal Trustees v. Haven*, 11 Ill., 554.

2d. But whether the release was or was not a complete bar to the action as suggested, the acceptance of the release by the trustees can upon no principle of construction be held as any recognition of the right of the Havens to claim recompense for that portion of the water

6145 which had been furnished by the trustees themselves, in the surplus discharge at Lockport.

So shocking an inference is forbidden by every rule:

"a"—Grants are to be construed most strongly against the grantor. Ang. W. C., Sec. 149 "f." *Alton v. Trans. Co.*, 12 Ill., 38.

"b"—But when even express grants are made by the state, the rule is reversed, and they are to be construed most favorably for the government. *People v. Brown*, 67 Ill., 438.

"c"—The release nowhere speaks of any water, but such as strictly pertained to the Desplaines river, as a part of its proper, natural, original and customary flow. Rec.,

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p. 26.

"d"—In the legal proceedings of which the release purported to be a final adjustment, it does not appear, from the reports, that there had ever been any pretense of a legal claim by the Havens to a drop of this surplus water, as entering into their estimate of damages against the trustees. So impudent and preposterous a claim was not thought of.

3d. The release, at all events, is to be construed with reference only to the facts and circumstances surrounding the parties at the time. *Wilcox v. McGhee*, 11 Ill., 381; *Hadden v. Shoutz*, 15 Ill., 582.

The Deep Cut, which, by a remarkable and unlooked for train of causes, was accomplished eighteen years afterwards, pouring 25,000 cubic feet of water per minute into the canal, was not then in the remotest contemplation of anybody. Even if it be supposed, that in 1853, in this settlement with the Havens, the canal trustees, to buy their peace, chose to ignore the distinction of right between the natural flow of the Desplaines river, and that much larger flow which they themselves at that time added at Lockport, still it is impossible to believe that by paying three thousand dollars for a grant of the river as a feeder to the canal, they intended at the same time to make a perpetual grant of the canal as a feeder to their

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river.



### ARGUMENT.

The certificate from the Appellate Court will be found to indicate substantially the following as the principal points for consideration, stating them in a condensed form:

*First.* Viewing the State of Illinois and Adam, as standing in the relation of upper and lower riparian proprietors on the Desplaines river, is the state guilty of a *diversion*, if it takes out above Adam's dam a portion of the water which it brings in from Lake Michigan?

6147 *Second.* Even if we suppose the state to be guilty of a diversion, by passing the water from the pool above Dam No. 2 down into the Channahon level on which the oat mill of the appellant is built, and where the water can by no possibility again become available to the appellee, can Slater & Druly be regarded as the responsible agents in this act of diversion, thus already consummated, by an operation of public authority at the lock and

*Third.* Adam having purchased subject to the release executed by his grantors in 1853, does that release operate to bar the action?

Or, on the other hand, does the mere acceptance of it by the canal trustee now bar the state from asserting as against the appellee an exclusive right to dispose of this *additional* volume of water obtained through the Deep Cut?

The first is the principal question, and to that we devote our chief attention; the interest of both parties and the public being to test the validity of the absolute right which the Canal Commissioners have deemed it their duty to assert, to lease the surplus water at Joliet, supplied by the recent improvement, in such modes as they find most productive of revenue and most

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6148 conducive to the public good. Was the Deep Cut, in other words, made for the benefit of William Adam or the State of Illinois? Is the water it supplies a monopoly to be enjoyed by the owner of Lot 1, Block 57, School Section, Joliet, or may its benefits be distributed to other localities in the town?

## I.

## THE CASE SHOWS NO DIVERSION BY THE STATE.

The main topographical features of the case are shown on the map accompanying the record, and we shall assume the court to be sufficiently advised of the relative localities involved. The facts also that are deemed essential to present the points, on which the decision of the court is sought, are drawn within a narrow compass by the agreed case. Nothing is left, but a question of law. If this water, which is the subject of the alleged diversion, is conveyed into the canal from Lake Michigan, through the works and at the expense of the state, and constitutes no part of the customary flow of the Desplaines river, can it be rightly drawn out again by the state, if done on her own premises; and if in doing so the natural flow of the river to Adam's Dam is not diminished but largely increased?

Perhaps the theory on which the appellant relies may be best illustrated by casting the prominent facts into the form of a hypothetical case.

Let A (the state) and B (Adam) be upper and lower riparian proprietors on a given natural water course (the Desplaines river), which we will designate as water  
6149 course No. 1.

A, the upper proprietor, happens to control another and entirely independent reservoir, designated as No. 2 (Lake Michigan), the waters of which, for certain purposes of his own, he

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desires to transmit across the channel of No. 1, by some suitable structures, the particular method being a mere question of judicious and economical engineering, governed by the local conditions of the case.

The plan which A in fact adopts is this: Instead of crossing *directly* at the point, where No. 1 is introduced into No. 2, by an aqueduct or by subterranean pipes, as we will suppose he might, he finds it expedient to cross at a point on his premises somewhat lower down, employing the channel of No. 1, as a temporary conduit for conveying the water of No. 2, to its destined point of exit, and there, by proper structures discharging this extra water into some channel of his own on the other side, which he has prepared for it.

By this process, the waters of the two streams are necessarily mingled together, while thus flowing in the joint or common channel, and are, of course, incapable of identification. But in the case supposed, the water is treated simply in its character as an agent for producing mechanical power, and the rights of the parties obviously admit of perfect adjustment on the basis of *equivalent quantities*. One cubic foot of water is as good as another cubic foot of water upon a water wheel; and the element of identity therefore is to be dismissed from the argument, as of no essential value.

*Question.* By thus withdrawing from No. 1 the water which he has temporarily added to it, is *A guilty of a diversion?*

A plain statement of the question comes little short of answering it. We certainly but express what at first blush seems a self-evident proposition, when we say, that A must possess a perfect right, as against B, to deduct from water course No. 1, by artificial channels the same amount of water which he has added to it by artificial channels; unless that right has been qualified by contract or prescription.

This proposition, we submit, is an inevitable inference from

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the elementary principles governing the relations between riparian owners.

*First.* Subject only to the reciprocal rights in the flow of the water existing between the dominant and servient estates, each riparian proprietor is the owner of the bed and banks forming the channel of a water course as absolutely to all intents and purposes, as he owns his farm upon its borders; and he may use it with precisely the same perfect and unqualified rights of dominion.

No one can call him to account for such use, save only in respect to the water which flows upon, through and from his land. This doctrine is too familiar to need the support of authorities.

*Second.* The law of riparian rights to which A, the upper owner, is subject, simply demands that he shall transmit to B, the *natural, proper and customary flow* of the stream, as he receives it from his neighbor above. And to that extent only is B at all concerned in A's part of the channel.

The general principles also, we presume, will not be disputed, and we only refer as a good, short statement of them to Broom's Maxims, 374.

It follows, of course, that B has no possible concern with the question how A chooses to use that portion of the channel which is within his own domain, any more than with the question how he might choose to subdivide, enclose or cultivate his fields. He, at all events, sustains no real, and as we humbly suppose, no *technical* injury, if A withdraws by a train of suitable structures what he has thus introduced from an exterior source.

It seems, indeed, too plain for argument, that no right of B is impaired, unless the dogma (for so we must call it), can be supported, that the instant a drop of water  
6152 is added to the volume of No. 1, it becomes an inseparable constituent part of it, with relation to the rights of B; no matter at what place, in what manner, by what party, or for what purpose the addition

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was made. The notion, surely, has no foundation in natural and rational justice; and, is warranted, as we believe, by no well considered authority.

In such a case, A's *intention* will be found a controlling and decisive consideration. If indeed he *intends* his contribution to No. 1, as a *permanent* addition to its flow, and not, with a view to resume it for some ulterior use of his own, then perhaps there are two or three decisions squinting towards the rule, that even *he* cannot divert it afterwards, though on his own land.

*Eddy v. Simpson*, 3 Cal., 249.

*Webb v. Portland Mfg. Co.*, 3 Sumner, 189.

*Tourtelotte v. Phelps*, 4 Gray, 370.

So if A adds extra water to No. 1, which he suffers to flow down in the channel and *abandons* to the public, in that case, as between B and those below *him*, say C and D, these still lower proprietors, might as against B, rightfully claim, that he should not divert it, from them. It cannot be doubted that it is in this sense, Angel says:

"It is also important to observe, that as each proprietor through whose land a water course passes has a right to the flow and descent of the water course, sub-  
6153 ject to a like reasonable use by all others, *he* necessar-

ily enjoys the benefits of any improvements made by the proprietors above him."

*Ang. Wat. Courses*, Sec. 95.

We believe, however, there are no well considered decisions which hold, that when A employs that part of the No. 1, belonging to him, simply as a convenient medium for transmitting the waters of No. 2 across into a channel which he has provided for his own purposes on the opposite side, B, as against A, acquires any legal right whatever in such extra water. There is not the slightest resemblance between the relations of A and B, and B and C in such a case.

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In support of our proposition we refer to

*Whittier v. Casheco Mfg. Co.*, 9 N. H., 454.

*Soc'y for Mfg. v. Morris Canal Co.*, Saxton, 157.

*Butte v. Vaughn*, 11 Cal., 143.

*Burnett v. Whitesides*, 15 Cal., 35.

*Elliott v. Fitchburg R. R. Co.*, 10 Cush., 191.

*Embury v. Owen*, 6 Exch., 360.

2d Washburne on Real Property, 329.

*Hoffman et al. v. Stone et al.*, 7 Cal., 46.

The leading authority supposed to hold the contrary is *Eddy v. Simpson*, 3 Cal., 249; the only case cited in that view by Washburne in the edition of his work on Easements, to which the writer has had access. If to be so construed, we shall soon see that it has been completely  
6154 overruled by later decisions of the same court.

In the case of *Hoffman v. Stone*, *supra*, the water course, answering to No. 1 in our hypothesis, was named Dutch Gulch. It was dry at certain seasons of the year, but, nevertheless, was by the court treated as a natural water course, on which plaintiffs and defendants held the relation of upper and lower riparian proprietors.

*Ang. Water Courses*, Sec. 4.

The defendants, it appears, owned a chain or system of artificial ditches for the supply of which it was convenient to use channel of Dutch Gulch as a connecting link. Under this plan, they took out in the end, the water they put in, so that it did not reach the plaintiffs. The plaintiffs alleged this to be a *diversion*; and sought relief by injunction, claiming the rights of prior locators, and the exclusive control of the channel. The court, however held, in substance:

1st. That defendants (A) might use the channel of No. 1, to pass the waters of No. 2 from one point to another.

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2. That the defendants (A) did not *abandon* the water to the use of No. 1; as it was evident that they put it in with the express purpose of taking it out again.

3. That while the physical conditions under which the rights of riparian owners in California existed were peculiar, yet they were regulated by no local statutes, and  
6155 were entirely governed by the rules and analogies of the common law.

This decision, as the court will see, proceeds upon the theory of natural and rational justice which we have assumed, viz., that B in any case is only entitled to the *natural* and *customary* flow of No. 1; that A may use the channel for his own convenience in any way he sees fit; and may, in entire consistency with the rights of B, again draw out the water which by artificial means he has put in for his own purposes, by his own structures, and at his own expense. In California, it would seem, that priority of location on government lands is held to give to the riparian proprietor some superior right in the channel and water of water courses. Such priority, if we mistake not, was enjoyed by the plaintiffs in all the California cases we have cited. But this, it is obvious, only serves to strengthen the force of the decisions as authorities in our favor.

The case of *The Butte Canal and Ditch Co. v. Vaughn*, *supra*, was an appeal to the Supreme Court of California, and was an action brought by the plaintiffs for the diversion of the waters of the south fork of Jackson Creek in the County of Amador. Defendant in his answer set up a right to a portion of the water, by virtue of a contract with the owners of the Amador County  
6156 Canal, which drained the north fork of the Mokelumme river. From this canal the water claimed by defendant was emptied into a natural ravine, and from thence flowed into the south fork of Jackson Creek, above the dam of plaintiff, and after descending the stream for a mile, was again

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taken up at a point above plaintiff's dam, and diverted through defendant's ditch to his mining ground.

The opinion of the court was delivered by Mr. Justice FIELD, who after reciting the above facts proceeded as follows:

"Upon these facts the single question is presented whether the defendants, after the mingling of the water conducted by them from the canal with the waters naturally flowing in the fork, possess the right to take out an equal or less quantity from the stream, or is the right of the defendants to the use of the water, whilst in the ravine, or to the use of an equal quantity, lost by its subsequent mingling with the natural waters of the fork?

The case is similar in its material features to that of *Hoffman et al. v. Stone et al.*, 7 Cal., 45, where this court per MURRAY, C. J., said:

6157 The plaintiffs, being the prior locators, it would follow that any interference with the waters of Dutch Gulch would be an infraction of their rights. But the appropriation of the waters did not give them the exclusive use of the bed of the stream. We see no reason why it might not be used by others as a channel for conducting water, so long as it did not interfere with their rights. If the defendants were diverting the natural water of the stream as well as that brought into it by themselves, then the plaintiff would have a just cause of complaint."

Justice Field then proceeds:

"In the case at bar the channel of the south fork of Jackson Creek is used as a connecting link between the Amador County Canal and the ditch of the defendants.

The point settled in the case of *Hoffman v. Stone* is this: That the prior right to the use of the natural water of a stream does not entitle the owner of such right to the exclusive use of the channel. *So long as his right is not interfered*

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*with, there is no reason why the bed of the stream may not be used by others as a channel for conducting water. If the plaintiffs in the present case receive their full supply, as previous to the introduction of water by the defendants, they have no cause of complaint.*

The plaintiffs rely, with apparent confidence, upon the case of *Eddy v. Simpson*, 3 Cal., 249, but in that



case the court said when the waters of Grizzly Canyon and Bloody Run left the possession of the defendants at Cherokee Corral, all right to, and interest in that water  
6158 was lost by the defendants. It might be made the property of whomsoever chose to possess it.

It is very evident that the court considered the fact that the water had passed from the possession of the defendants, and found its way to Shady Creek, without their agency, as material circumstances of the case; in other words, it regarded the water as having been *abandoned*.

The first appropriator of the water of a stream passing through the public lands in this State, has the right to insist that the water shall be subject to his use, and enjoyment, to the extent of his original appropriation. To this extent his rights go, and no farther. In subordination to these rights subsequent appropriations may make such use of the channel of the stream as they think proper, and they may mingle with its waters other waters, and divert an equal quantity, as often as they choose.

The judgment of the court below must accordingly be reversed, and the case remanded."

This opinion by Justice FIELD, now of the Supreme Court of the United States, it cannot be denied fully recognizes the doctrine we contend for; not under peculiar California stat-

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6159 utes, not upon any anomalous principles of justice growing out of the physical peculiarities of that State, but upon the plain analogies of the common law.

He refers, as will be noticed, to the case of *Eddy v. Simpson* (cited in Washburne on Easements as holding a contrary doctrine); and without very emphatically approving that case, distinguishes it from the one in hand by the circumstance, that the defendant claiming to have brought in water from an extra source, No. 2, was there held to have *abandoned* it to public use.

These decisions, unless we entirely misapprehended them, settle the main question involved in the case at bar, and that, too, upon common law principles. The physical conformation and peculiar industries of Cali-

6160 fornia, have no doubt presented cases of this kind for adjudication oftener than any other region of the Union; yet, the question has been in every instance argued and decided substantially upon common law principles, unmodified by any special legislation, precisely as was done in the New Hampshire, Massachusetts and New Jersey cases which we have cited. The court in *Hoffman v. Stone*, declared expressly that it acted upon the analogies of the common law, unaided by any statutory regulations. Indeed its ruling in every instance was simply an application of universal principles of natural reason and justice to the mutual rights of riparian proprietors along a natural water course; principles just as applicable within the borders of Illinois to parties in a like predicament, as in the mountains and valleys of California.

*Burnett v. Whitesides*, 15 Cal., 35.

Of this case the writer has no copy, nor full abstract; but in a note to I Hilliard on Torts, p. 661, we find it cited to the following effect:

"Plaintiff and defendant both drawing water from the same stream, and the plaintiff having the priority of right, if the

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defendant introduce into the stream water obtained from a foreign source, he has the right to divert the quantity thus emptied into it, 'less such amount as might be lost by evaporation and other like causes'; but the water cannot be reclaimed so as to *diminish* the quantity to which the plaintiff is entitled as prior locator."

In the case at bar the State not only does not *diminish*, but in fact more than *doubles* Adam's supply. His only grievance as the record will show, consists in having a miserably poor mill-privilege improved by the State into first-class property.

See Rec., p. 23.

6161 The case of *Elliott v. Fitch. R. R. Co.*, *supra*, declares substantially the same principle as that announced in the California cases. It holds, in effect, that when A takes out from No. 1, only what he contributes from No. 2 (his own reservoir), B cannot complain of a wrongful diversion; and this, not upon the principle of set-off or compensating advantage, but upon the general ground of reason and justice, that when a party withdraws from a

water course no more than he adds to it by his own improvements, it is no diversion.

In the important case, of the *Society for Establishing Manufacturers v. Morris Canal Co.*, 1 N. J. Equity Reports, 157, argued by most distinguished counsel of the New York, Pennsylvania and New Jersey, bar, the opinion of Chancellor Vroom is very emphatic as to the right of the defendant, *The Morris Canal Co.*, to introduce into the Rockaway river the water of Lake Hopatcong, and a branch of the Raritan, and then take out of the Rockaway below, sufficient for canal purposes, if not thereby diminishing the natural flow of the stream. "If, then," says the learned Chancellor, "the defendants take from the Rockaway no greater quantity of water than they bring in (and they claim the right to do no more), will not the Society (the complainants) enjoy their privilege

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without diminution or alteration, or can they in anywise be injured?" The court in this case clearly recognizes the right of the Canal Company to use the Rockaway as a common channel to conduct the extra water to a certain point and resume its use again for the purpose of the canal, notwithstanding the fact that this water was not returned to the passaic till it passed the great falls at Paterson, where complainants' manufactories were established.

In opposition to this current of authority, we have failed to discover a single case, that when fairly read, and with careful reference to the state of facts which molded and gave complexion to the opinion, can be regarded as holding the contrary. All such as are supposed to bear adversely will be found distinguishable by one or both of two features:

1. The controversy was not between A and B (if we may still use our hypothesis, as a convenience), but between B and C. C, a still lower riparian proprietor, claiming as against B, that he (C) had a right to the benefit of the water abandoned by A, the uppermost owner, to the general future use of all the lower proprietors on the stream.

*Tourtelotte v. Phelps*, 4 Gray, 370.

2. In none of the cases where A was forbidden to divert the water contributed by himself, will it appear,

that he had made the contribution, as in the case at bar, under a comprehensive, connected plan, executed by a train of suitable structures, *to withdraw it again*, upon his own premises; but, under such circumstances that it was characterized as a permanent, irrevocable dedication to public use. Having once thus "*abandoned*" it, 6163 he was not permitted to revoke the gift.

Yet it will throw some light on this part of the argument to consult also the following authorities on the subject of artificial water courses:

*Wood v. Waugh*, 3 Exch., 748.

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Angell on W. C., Sec. 433 (note 1).

2 Wash. R. Pro., 329.

*Gaved v. Martyn*, 115 E. C. L.

Broom's Leg. Max., 375.

From these, it will be seen, that so strictly have the rights of riparian proprietors been limited to the *natural* flow of the stream, that in cases where *artificial* tributaries had been continued in operation for more than twenty years by A, B, nevertheless, was held to have acquired no *prescriptive* rights therein. This strongly illustrates our position. If A can thus at any time *ad libitum* cut off the artificial tributary No. 2, and divert it into some other channel than No. 1, we ask on what principle can it be maintained that he may not, with as little injury to B's legal rights, use his own part of No. 1, as a channel to pass the water from one point to another of his own premises? How is B injured in one case more than in the other?

Upon this point we cannot conclude without again quoting a little more at length from *Hoffman v. Stone*, cited, *supra*.

6164 The action, as we have already stated, was brought by the owners of a ditch (which received its supply of water from Dutch Creek, or ravine, near its mouth), in El Dorado County, for the purpose of procuring a perpetual injunction against the defendants, restraining them from diverting or appropriating the waters of the said ravine. The defense was, that Dutch Gulch, was usually a dry creek, affording no natural water during the summer months, and that the defendants, in order to connect two of their canals, had precipitated the water from the upper one into the creek, and taken

the same out again, by means of a dam, into their lower ditch, and that they had not interfered with the natural water of said ravine.

The court, speaking through Chief Justice MURRAY, said:

"The former decisions of this court, in cases involving the rights of parties to appropriate waters for mining and other

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purposes, have been based upon the wants of the community, and the peculiar condition of things in this state (for which there is no precedent), rather than any absolute rule of law governing such cases.

The *absence of legislation* on this subject has devolved upon the courts the necessity of framing rules for the protection of this great interest, and in determining these questions *we have conformed as nearly as possible to the analogies of the common law.*

In the case before us it is shown that Dutch Gulch was a mere torrent, dry at certain seasons of the year; that it was used by the defendants as a part of their ditch for conducting water from another stream down to their dam. That in point of fact the water so brought to Dutch Gulch, and turned in there by defendants, was not abandoned by them, but was turned in for the purpose of being conveyed to their dam. That there was, at the time of the commencement of this suit, no natural water flowing in the bed of the stream, and that all the waters so diverted by the defendants were artificial, or waters conducted there by them.

The plaintiffs being the prior locators, it would follow that any interference with the waters of Dutch Gulch would be an infraction of their rights. But the appropriation of the waters did not give them the exclusive use of the *bed* of the stream. We see no reason why it might not be used by *others as a channel for conducting water, so long as it did not interfere with their rights.* If the defendant were diverting the *natural* water of the stream, as well as that brought into it by themselves, then the plaintiffs would have a just cause of complaint. It would be a harsh rule, however, to require those engaged in these enterprises to construct an actual ditch along the whole route through

which the waters were to be carried, and to refuse them the *economy that nature*

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*occasionally afforded* in the shape of a dry ravine, gulch or canyon. It is contended, however, that this case falls within the rule of *Eddy v. Simpson*, 3 Cal., and *Kelly & Co. v. Natoma Water Co.*, Jan. T., 1856. We do not think so. The verdict of the jury finds that the water was *not abandoned* by the defendants, and left to find its way by natural channels into Dutch Gulch, but was *turned in* by the defendants, making a connecting link of their ditch."

We now submit, that both on principle and authority, the State of Illinois, as the upper riparian owner, has the right to withdraw from the river Desplaines a quantity of water equal to that which it contributed from Lake Michigan, provided that it is done on its own premises; that its rights have not been relinquished by contract; and that it has done no act operating as a final and irrevocable abandonment thereof to public use.

THE CREATION OF WATER POWER WAS ONE OF THE OBJECTS CONTEMPLATED IN THE ORIGINAL PLAN OF THE CANAL.

6167 An attempt was made in the argument of our opponents in the court below, to show, by referring to the several acts of the legislature, under which the Deep Cut was completed, that the water thus obtained loses its character as the proper water of the Illinois and Michigan Canal, below the Summit Level; and it seems to have made more impression upon the Appellate Court than we anticipated.

It is a matter of public history well known to the court, that the original and long cherished plan of the canal was to supply the Summit Level from Lake Michigan, precisely as it is now supplied. Much of the work, in fact, had been done before the suspension, which occurred in 1840. When the enterprise was resumed in 1845, under the well remembered trust created to secure the bondholders, the then embarrassed financial condition of the state compelled a relinquishment of the original

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scheme, and the substitution of what was termed the

"raised or shallow cut," to be supplied by pumps at Bridgeport, with the aid of the Calumet Feeder.

In 1865 the City of Chicago found itself confronted by the formidable problem of drainage, for the health and comfort of its citizens; and deeming that this object might be promoted if not effectually accomplished by completing the old deep cut, already partially excavated, asked permission of the state to take hold and finish the work. Permission was given by the act of 16th April, 1865, entitled "*An Act to provide for the completion of the I. & M. C. upon the plan adopted by the State in 1836.*" Besides this title, which seems  
6168 significant enough, the preamble to the act contains a reference to the past history of the improvement,—the original plan,—"its abandonment for the time being,"—the precarious and unsatisfactory nature of the mode of supply from the Calumet feeder and hydraulic works at Bridgeport, and the great benefit to the canal itself to be expected by deepening the cut.

*See Public Laws, 1865, pp. 83-4.*

The work accordingly was undertaken and was completed in 1871, at an expense of several millions of dollars, and the cost soon after refunded to the City of Chicago by the state.

With all due respect to the Appellate Court we must say, as we said on a previous occasion, that we deem it unnecessary to seriously argue the point which counsel had suggested, based on the special circumstances that led to the execution of the improvement. Is it not enough that it was in fact made? Is it not enough that the deep cut is in fact an integral part of the whole canal? Is not the condition of the case, for all legal purposes, precisely the same as if the work had been done in the first instance by the state, instead of by the City of Chicago, and done in 1848 instead of 1871? Can this part of the canal, now that it is finished and paid for out of the state treasury, be

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distinguished from any other part, as to the jurisdiction of the state over it, or over the water in it, in any  
6170 respect whatever?



RIGHT OF THE CANAL COMMISSIONERS TO CREATE AND LEASE  
WATER POWER.

But again, the counsel for appellee, in their previous argument, expressed a doubt, whether it was quite according to law for the Canal Commissioners to create and lease water power to help repair, improve and support the canal; and to sustain this view, ransacked the canal laws *ab initio*, not forgetting the act of Congress of 1822.

To this somewhat remarkable position we reply:

1. While navigation is the *primary* and cardinal object of every navigable canal, yet, to create water power as an incident, has been the universal policy of such enterprises, whether undertaken at the public expense or by private corporations. The disposal of the water in descending from one level to another must necessarily be in the control of the state, and the public good, as we had supposed, demands both that it should be utilized in aid of the manufacturing interests of the country and made to contribute as far as possible, to the expense of maintaining the work. Such, at all events, we know, has been the unquestioned policy of the Illinois and Michigan Canal, for more than thirty years. No express statute indeed was required to make it the bounden duty of the Canal Commissioners, in the vigilant fulfillment of their public trust, to add in this way to the limited revenues of the canal, wherever they found it practicable. The particular details of administration in respect to this branch of their official charge, are necessarily confided to their own judgment and discretion. Special occasions have arisen and may again arise for special statutes on this subject; but the particular methods of creating water

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power at any given place must, as a general rule, be a question for the commissioners, with the advice of their engineer.

2. The statute regulating their powers and duties expressly gives them a plenary authority to lease water power; as a recognized source of canal income.

R. St. (1874), p. 189, Sec. 8, Ch. 19.

The expression here used "and lands and lots connected therewith," cannot well be construed as intended

to exclude cases where the State happened to own no lands or lots adjoining the *locus* of the waterfall. Ordinarily such a connection would exist, but it would not, where the site occurs on a school section, as in the case here, or on Government lands. Still, unless the two subjects enumerated in the clause "water power" and "lots" are, from their nature, indissolubly incorporated together, as objects of sale or contract, they are to be taken severally. We are to look at the main design of the law; and that we cannot doubt was to utilize the surplus water for the benefit of the State, wherever possible to do so.

- 6172 3. But lastly, the question is entirely immaterial. If the appellee is legally entitled to the water, the point is needless;—if he is not, of course its use by the commissioners is no concern of his.

#### IS THE WATER ABANDONED AT LOCKPORT?

It was contended, by our opponents, and the Appellate Court seems to have yielded to their reasoning, that admitting the general principles under which we claim the right of the State to draw out above the appellee's dam the water derived from Lake Michigan, yet they are not available to us in this case; that they apply only where he who asserts them is riparian owner *continuously* for the whole distance, from the point of introduction to the point of discharge; that here the State

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is not shown to own any land upon either bank of the Desplaines river between Lockport and its junction with the canal in the upper basin at Joliet; and that the water being thus allowed to escape into a foreign water course, at a point where the State has no right as a riparian owner, it must, therefore, be deemed to be abandoned, and that being abandoned it is thenceforth incorporated with the proper water of the river, so far as respects the rights of the riparian owners below.

#### THE INTENTION OF THE STATE.

- 6173 On this point, to which the opinion of the Appellate Court gives prominence, our first inquiry will be, what was the *intention* of the State as evinced in the plan of

the canal? For it will be difficult to maintain, that anything is effectually abandoned, which the owner evidently purposes to immediately resume and control for his own future use.

To begin with, the entire plan of the canal is to be treated as a *unit*, and viewed, comprehensively; each part in its relation to every other part, however remote. The chain or system of structures composing it as a whole, must be surveyed, also, in connection with the physical peculiarities of the region through which it passes; for, in planning such a work the engineer must necessarily adapt it to the contiguous localities.

The relative course and comparative levels of the river and canal between Lockport and Joliet are shown, in a general way on the map which the court has before it.

The conditions are such, it will be seen, that the surplus water discharged at Lockport, through Norton & Co.'s tail race and through the waste weir, necessarily seeks and pursues the natural depression constituting the channel of the Desplaines river for a distance of about three miles, joining the canal again between Lock No. 4 and Dam No. 1.

And this is called an irreclaimable *abandonment*, operating

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6174 to extinguish any proprietary rights of the State in the water, and making it in a legal sense at least as to the appellee, Adam, a constituent part of the proper customary and natural flow of the Desplaines river! But now let counsel explain what they mean by *abandonment*? The only force of the term as here used is to signify some act or default of the State, by which it loses its *jus disponendi* in the water, as a subject of future exclusive control. What is it? Where do we find it? No actual *personal* intention to abandon in this sense can be imputed to the commissioners; for that is conclusively negatived by the very facts which led to this suit. The surplus in question had only come into existence in 1871, and during this short interval there surely is nothing shown in the record to indicate any such intention on the part of the canal authorities; no act, no declaration, no prolonged *non-user*, which can possibly be construed as having that effect. Indeed this *lease* to Slater & Druley in 1878, may have been and probably was the

first opportunity that offered for a lease of water power on this new plan, below Dam No. 2. Possibly the plan itself had not before occurred to the commissioners. At all events, there is nothing tending to show any actual purpose of the official representatives of the State to abandon, in the sense here supposed.

6175 Again, no abandonment could be predicated upon the bare fact that the water is transferred from one level to another, provided it passes all the way through the prism of the canal or some appurtenant channel belonging to the State, made for that very purpose. Nor, upon the supposition that the water has been permanently and finally detached from its relations to the canal; because, it is obvious that it is destined to be taken in again but a short distance below, and, that, too, as a necessary physical consequence of the *plan* of the canal itself. This return of the water to the canal is just as certain to take

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place as if the water descended from the one level to the other between the very walls of the canal.

Where then is the abandonment? It must consist, if at all, in this;—that in descending from one level to another, it makes a short *detour* through a foreign channel, situated most conveniently for the purpose, but which unfortunately does not for this intermediate distance belong to the State as riparian owner. This circumstance, quite unimportant one would think, to the beneficial rights of Mr. Adam, suggests to his counsel the notion that the instant the water passes from the premises of the State, although immediately returned again and found in the canal, long before it reaches the boundary line between the State and Adam, it becomes transformed as to him into “the natural, proper and customary flow” of the Desplaines river. Does not this approach absurdity?

6176 The waters are mingled, it is true, and can no longer be distinguished and identified. But, as we have previously remarked, this identification is not necessary to a proper adjustment of the substantial rights of the parties concerned. The water is recognized in this action only in its character as an agent of mechanical power; and any one cubic foot of the fluid, under the same conditions of fall, is precisely the same

as any other. When two or more mill owners are interested in certain proportions in a volume of water thus mingled from different sources, the quantities belonging to each can be measured with reasonable certainty, and their relative rights duly ascertained and enforced. If Mr. B, in our hypothesis is entitled to receive and does receive 10,000 cubic feet of water at his mill, how can it concern any rights or interests of his, from whence it comes, or through what previous conditions of transmission it has passed, before reaching his pond? A court of justice will not perplex itself with such fruitless and senseless trifling. It will define nothing as even a technical right except such as may be supposed to be in some possible

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way and some conceivable degree beneficial to the plaintiff. But this confusion of the element of water as a mechanical agent, by the necessary intercommunication occurring between different water courses, can produce no injury to any party interested. Hence, we assume that the legal *status* of the waters in question here cannot be affected in the least by the mere circumstance of having thus commingled in one stage of their course.

6177 Again, we ask, where does the abandonment come in? It does not necessarily result from the mere fact that the State is not riparian *proprietor* in fee on the Desplaines continuously from Lockport to the point of junction at Joliet. Suppose the State had procured a *lease* or the *written consent* of all the land-owners on both sides of the river to so use the channel. Would not this have obviated the ground of objection? We have indeed no proof of any such written consent from them; but suppose that for thirty years they have in fact made no complaint of this use by the State; and have thus tacitly and impliedly acquiesced, would not the effect be the same? Now, this happens to be the precise truth here, as we may fairly infer from the record. From the very beginning the State was known to have appropriated the river to its service as a feeder, in respect to whatever water it could supply from its own sources and affluents. It is in fact named as a feeder in the Haven's release. (Record, 25.)

And this additional but homogeneous use, even if it could not be claimed as a matter of right, was not and

could not be objected to by the land owners who were already subject to the prior easement. The improved flow across their own premises could be no possible detriment to them. Those who owned mill sites would hardly object to the free gift of 25,000 cubic feet of water per minute to turn their wheels. They would have acquired, indeed, no vested right in this improved flow, and the State could withhold it any day, without afford-

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ing just ground of complaint; but while permitted to enjoy it they must be presumed from the dictates of self-interest to consent to the use of the channel made by the State for its own ulterior purposes. Now, if the river was employed as a medium of transmission with their consent, as we must presume, is not the case essentially the same as if the State happened to be riparian proprietor in fee continuously from Lockport to Dam No. 2?

But even with and against their consent, the result, we submit, would still be the same—so far as the appellee is concerned. It would in that case be exclusively and strictly a question between the State and these riparian proprietors, not affecting or concerning those above or below them in the least. If the State made an unauthorized use of their respective portions of the river, detrimental to their rights, justice would dictate that they should have redress. But how would this wrong committed upon them individually, have any proper bearing on the question, whether the State, as to Adam, had abandoned the water for his benefit? It is quite indifferent to him, one would suppose, under what relations as between the State and these upper proprietors the water might make its way down to Dam No. 2. In either or any case it is inevitably destined to rejoin the canal, and is accompanied all along with the constant intention of resuming control of it for alleged canal purposes.

## SUMMARY.

We conclude, then, as to our first and main proposition:

1st. That an upper riparian proprietor upon a natural water course, who within his own domain puts in water from an exterior source may again take it out,

unless between the points of introduction and discharge, he has done some act or placed the water under some local conditions which, in reason

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and law, amount to a renunciation of this right of exclusive control.

2nd. That the record here discloses no such act, and no such local conditions.

3rd. That it is immaterial to the issues here how the deep cut happened to get finished, or how the City of Chicago was interested in the flow of water, as effecting her problem of drainage. The summit level is at all events a constituent, integral part of the canal; and the water received into it is in precisely the same legal predicament, as if the work had been done by the State in the first instance.

6180 4th. That except as the proposition may be qualified by special contract in respect to the rights of particular individuals, all water received into the canal from whatever source, or to subserve whatever incidental object, is to be deemed the proper water of the canal to be used for all proper canal purposes; that it has universally been recognized as a legitimate object and economy of canal management to create and lease water power wherever practicable; that our statute recognizes the object in express terms, and that the right of property in the State to the water in the Illinois and Michigan Canal, with respect to that object, rests upon the same grounds as its right to water needed for purposes of navigation. The rents from mills is as desirable and legitimate a source of canal revenue as the tolls from boats.

5th. And finally, that for these reasons there has been no diversion from the mill of appellee, unless the rights of the State, in the surplus water first created in 1871, have been in some way abridged by the transaction with Haven, and Haven, in 1853.

This matter of the release will be considered hereafter.

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## II.

THE DIVERSION, IF ANY, BEING CONSUMMATED AT DAM NO. 2, IT CANNOT BE IMPUTED TO THE LESSEES OF WATER POWER ON A LOWER LEVEL, AS THE RESPONSIBLE AGENTS THERE-OF.

6181 The oat mill of the defendants is situated on the berm bank of the canal, about a mile below Dam No. 2. At this dam, the water, that is not suffered to flow into the channel of the river and thence down to appellee's mill, is discharged into the Channahon level through the lock and a bulkhead, constructed for the purpose.

At this point, as the court has seen, the canal has entirely completed its crossing of the Desplaines river and from thence onward pursues a separate and independent course.

Hence the instant the water leaves the pool of the dam and descends into the Channahon level it becomes by a physical necessity forever detached from all relations of riparian right with the river and the mill and dam of the plaintiff.

When it reaches a point opposite the defendant's mill, it can no more be identified or recognized as river water than at a point ten miles below or at Ottawa or La Salle.

The act of *diversion*, therefore, that act which completely accomplishes the injury to the plaintiff, if any there be, takes place at Dam No. 2; for it must *ex vi termini* consist in that operation, or series of operations, by which the water, instead of being suffered to flow over the dam into the river channel and down to Adam's wheels, is irrevocably turned away in another direction. And in this operation, performed as it must be, by the functionaries of the State, in the official administration of the affairs of the canal, the defendants, we humbly submit, can be supposed to exercise no responsible agency. The stage of water in the Channahon level from time to time, and

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the methods of supplying it, are matters of exclusive official cognizance and regulation, in which third persons have no concern.

The water being by this process already irrevocably

diverted Adam, as a riparian proprietor, has no further concern with it. In its mere character as a physical substance, he sets up no right to it in this suit. The *use* is all he claims, and he can assert no *usufructuary* right, except where he finds it existing under such local relations to his mill, that *he* himself could use it as a motive power, if the defendants did not. But is it not obvious, that when the water has reached down to a point opposite their head gates, it can be of no *benefit* to him in any possible event, and it therefore can be no *injury* to him, if used by others? If the use of it by Slater & Druly was no legal *injury* to him, how can it be denominated a diversion in the sense of the law? Does it not seem too plain for serious dispute, that the act of diversion, if any, is performed at the point where the road forks, so to speak, and is there performed by the  
 6183 sole agency of the officers of the State, in the execution of their public duties? The only claim of the appellee to the water, we repeat, is that of *user* for hydraulic purposes at his mill, and so the declaration expressly describes it. He asserts no right to it otherwise; and this usufructuary interest is only supposable under conditions which make it possible for *him* to use it at *his* mill. After it has passed down and out from these conditions, and is found in some place entirely beyond their range, certainly it can no longer afford a cause of action to him.

But it is said, that the lessees of the water power became joint wrongdoers with the official agents of the State, by accepting the lease. They knew, or were bound to know, that the water they contracted to receive was due to Adam, and thus in law became parties to the diversion. We cannot think the view tenable at all.

While the State in its relations with its citizens is in justice

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bound to afford redress for wrongs of this description, if wrongs they be, done under its authority, yet it is an express requirement of our public policy, that relief in such cases should be sought from the Legislature by petition, rather than from the courts by action. No application of this principle can be more obvious, than to the  
 6184 affairs of the canal; and especially to a case like this at bar. The commissioners, and their executive officers, by

authority from them, are invested with entire jurisdiction over the canal and its waters and over all its operations in regulating the stage of water from time to time on the several levels. In dealing with these representatives of the State in respect to the water of the canal at any given point in the line, it would be most unjust to ask private individuals to inquire at their peril as to the particular sources from which the water was derived, and the special conditions of private right to which it might be subject here and there. *There* is the water, within the banks of the Illinois and Michigan Canal, in the undisputed and absolute possession of the agents of the State; a possession, which whether right or wrong, no one can interfere with. What could Slater & Druly be supposed to know, when they took their lease, about this old Havens settlement in 1853, if indeed it ought to cut any figure in the case at all? The persons controlling and regulating the stage of water in the several levels, and its transmission from one to another were public officers, acting under official responsibility, and presumed from every *prima facie* indication of authority, to be acting rightly.

*Ballance v. Underhill*, 3 Scam., 453.

*Glancy v. Ellicott*, 14 Ill., 456.

*Todemier v. Aspinwall*, 43 Ill., 401.

- 6185 They appeared to be in the full undisputed possession of the water; and, by all the analogies of the law, that possession was presumptive evidence to third persons of a plenary

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right to control it. In fact the presumption ought, we think, to be stronger here, than in ordinary cases of the possession of property, which could be physically identified and distinguished; for, it is impossible to make any discrimination, based on diverse proprietary rights, in regard to the aggregate mass of water contained in the canal. But it may be argued that the defendants knew the local relations of the canal and river, and therefore the rights of Adam; because, these rights were inferable from those relations. This would be carrying the rule relied on very far. Two courts have passed on the question and have differed diametrically in their opinion. Were these plain grinders of oat meal to "know the true

prince by instinct," when wise judges thus differed, after elaborate argument?

6186 But the learned judge delivering the opinion of the Appellate Court, places his main stress, if we understand him correctly, upon the release from Haven & Haven, as going far to establish the rights of Adam. With all due deference, we cannot but think and shall endeavor respectfully to show, that the court was here in error; but, be this as it may, what evidence is there in this record, that these lessees before this suit was brought knew anything about that release? And what was there

to put them upon inquiry? When public officers, in managing public property, under a discretionary legal authority, which is *prima facie* sufficient, contract in any instance with individuals, and under that contract act jointly with them, the *scienter*, the tortious intent would seem to be indispensable to make their co-contractors joint tort feorsors.

*Hilliard on Torts*, Vol. 2, pp. 155-255.

*Main v. McCarty*, 15 Ill., 441.

*Jermaine v. Wagner*, 1 Hill (N. Y.), 284.

In the case late cited, decided by the Supreme Court, of the

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State of New York, acts done under the authority of the Canal Commissioners of that State were sought to be justified "because the canal commissioners had jurisdiction of the subject matter;" and it was argued, that "although the latter might not be protected, yet the defendants should be, inasmuch as they acted under the direction of a body which was *prima facie* authorized to give the direction." The court seem to have fully recognized the general principle for which we contend, but held in that case that the commissioners had no *prima facie* authority.

In this connection, it may not be unworthy of notice as a consideration of some significance, that the Canal Commissioners are themselves exempted by law from being sued.

R. S., Ch. 19, Sec. 3.

6187 The object of this is manifest. It was deemed mischievous to the public interests, that the acts of the commissioners, who are declared "for all legal purposes" to be "officers of the State" should be left lia-

ble to the vexations and obstructions of daily litigation. How far this exemption ought to be extended, or whether it is subject to any exceptions, we need not say. It is very clear, at all events, that a case like this, of all others, falls within the scope of the policy thus established. This on its very face is a square direct contest between William Adam and the State of Illinois; involving a question of public concern; whether the surplus water drawn from Lake Michigan by a cut through miles of solid rock at a cost of millions of dollars, belongs to him and his little 7 by 9 mill, or to the State of Illinois. If he is aggrieved by the State, the constitution denies him any method of redress, save one supposed to be ample under a just and enlightened government, and that is, to lay his case before the General Assembly. But this he conceived would be an inconvenient, perhaps an expensive, and certainly a very *hazardous* experiment; so he

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casts about him for some way to evade the constitution and the laws, and finally brings suit against these innocent lessees, who had erected a large and expensive mill, upon the faith of their contract with the official agents of the State of Illinois. The point we have been  
6188 considering is entirely needless, as we suppose, for our defense, and we shall expend no more labor upon it; but it will be for the court to say, whether such a suit is not a palpable evasion of our policy, as to the administration of public property; and if so, whether it ought to be favored or maintained. If the tort is by statute no tort against the State or its officers, ought it in justice to be held a tort against these lessees?

If not, how can they be described as joint tort feasons, upon the general principles connecting joint trespassers in responsibility?

### III.

#### THE HAVENS RELEASE.

The point made on the trial of the cause, that the release executed by the plaintiff's grantors, Haven and Haven, in 1853, operated as a bar to the action, we do not care to press at much length in argument here. It does not touch the main and really interesting question

in the case, on which the opinion of the court is desired; and is we hope, entirely superfluous for any necessary purpose of defense. A word therefore in reference to it will suffice.

The question is one of fair construction. On expression in the release, if taken literally, limits its operation to "purposes of navigation as contradistinguished from any other purpose." It is argued, and, we confess, not without plausibility, that this excludes the idea of a full and complete power of disposition over the water taken. But the grant, although expressed to

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6189 he for "purposes of navigation," was in practical effect a grant of the entire stream; unless construed as subject to a tacit condition that the trustees should always maintain its other feeders *in statu quo*, and that the Desplaines should only be required to furnish for purposes of navigation, its proportionate share, *in conjunction* with those other feeders. We are not convinced that the trustees in this compromise meant to so bind themselves. It would hardly comport with public policy, that the rights of the State in reference to any one of its several feeders should be hampered by such a restriction, precluding it from any future change in its system of supply, however expedient, without incurring the risk of forfeiture. We think, that while it was not then deemed probable that there would be any material alteration, yet, the river was turned over to the trustees as a feeder for any and all the uses and purposes attributable to any canal feeder. To employ the term "for purposes of navigation," as a term of cautious limitation, in connection with this contemptible rivulet and the Havens' still more contemptible interest in it, would have been ridiculous. If the State had the right to the whole of it, irrespective of other feeders, to fill the level, it was perfectly well known that there never could be to the end of time a *surplus* to use for water power; and hence we felt justified in contending on the trial that the release, when fairly construed, was intended to be general and unlimited; and the entire waters of the river turned over to the trustees to use at their discretion. Even an arrangement of that kind must have been regarded by the Havens as highly advantageous to them; because this court had just decided in 11th Ill. that they

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were riparian owners only on one side, that their dam was wholly unauthorized beyond the center of the stream, that they were at the mercy of the State, as the owner of the opposite bank, for their power; and that they could expect no more than nominal damages by any assessment that the courts would sustain. The compro-

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mise was assented to by the trustees, because on their part they did not choose to be harassed with perpetual suits for even nominal damages.

The Appellate Court, however, if we rightly apprehend its decision, adopted the conclusion, not only that the release was no bar to the action, but that it even had the effect of giving to the plaintiff as grantee of the Havens, a right to claim as riparian owner this vast additional volume of water, produced eighteen years afterwards by an improvement which entirely revolutionized the former system of supply—an addition exceeding, probably, twenty times the natural flow of the Desplaines in 1853!

6191 Holding that court, as we do, in the highest respect, we must nevertheless, be permitted to insist here most strenuously and confidently that their position is unwarranted by any just construction of the release.

The whole transaction between the Havens and the Canal Trustees had reference to the *state of things then existing*.

The canal had been completed in 1848 upon the shallow cut or raised level plan, as the best the State in those hard times could do. Instead of a direct and never-failing supply from the lake, the level was to be supplied by the poor expedient of pumps at Bridgeport, reinforced by the Calumet, and the feeble and uncertain tributes in spring and fall of the little Desplaines. There are probably upon the bench of this court those who personally know how little anybody in Illinois at that early day expected the time would ever come, when this channel would be carved deep through miles of solid rock to the inexhaustible bosom of the lake. It is fair to affirm positively, that neither of the parties to this agreement, the Havens or the Trustees, thought of such a thing as the ultimate finishing of the Deep Cut, any more than they thought of the millennium. In fact at that



time the railroad era had dawned in Illinois, putting water communications completely in the

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background, and making it exceedingly doubtful whether the State would ever spend another dollar on that kind of internal improvements. But the release itself contains abundant intrinsic evidence, that the whole arrangement had reference to the particular state of facts existing in 1853. It recites the claim of the releasors as riparian owners on the Desplaines river, that they had suffered damage by the diversion of the water belonging to them as such owners, the legal proceedings pending to settle the question in dispute, and the expediency of stopping the litigation, by compromise; and then proceeds to set forth the terms of adjustment agreed on. Some disputed questions, it is true, had already been adjudicated in this court.

*Canal Trustees v. Haven*, 5 Gil., 556.

*Same v. Same*, 11 Ill., 554.

6193 In the first case, which went up on an agreement as to the facts, it was decided that the Act of Congress of 1822 did not apply to school sections, that although the Desplaines river had been meandered, the grantees from the Government took to the center of the stream, and that the Havens were to be regarded as riparian proprietors, and as such entitled to recover for any diversion of the water of the river. In the second case, it was decided, that the Havens were riparian owners only on the east bank; but were entitled to at least nominal damages. Both cases, as will be seen, simply recognize the old familiar common law rules on the subject of riparian ownership and diversion. At all events, it is entirely certain that in neither was there a single intimation that the Havens occupied any other position than that of ordinary riparian owners on a natural water course; or that, from the peculiar relations between the river and the canal, they could claim damages for the diversion of any water other than that which could be shown to be the natural, customary and proper flow of their stream.

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Nor did the release contemplate any extension or modification of their common law rights as riparian owners, further than this, that the State, as represented and

bound by the canal trustees, might perhaps be held to have virtually acquiesced in their right to thereafter maintain their *dam* across the whole width of the river to the bank of the canal, using that bank for their west abutment;—a right which they did not possess before. But the learned judge who speaks for the Appellate Court, argues, that at that time, in 1853, the surplus water from the summit level, discharged at Lockport into the Desplaines, came down to the pool above Dam No. 2, by precisely the same process as does the immensely increased flow now; and that the trustees, in *accepting* this release virtually recognized this surplus as a part of the legitimate flow of the river, for the diversion of which the Havens were entitled to damage. Where did the court find in the record in this case any warrant for such a proposition? Certainly not in either of the decisions of this court which have been cited. Certainly in no express grant, declaration, or admission of the trustees, for they made none. Certainly not in the language of the release, because it nowhere speaks of the water in dispute, otherwise than as “the waters of said Desplaines river.” But what were the waters of the Desplaines river? The particular point arising here was not referred to in either of the decisions of this court. It is quite evident it was not considered in the assessment of damages, from which the second appeal was taken. In the opinion (11th Ill., 554), Justice TREAT speaks only of “diverting the *water of the river* from its natural channel,”—“of the use of the water as it is *accustomed* to flow along the channel,”—of the right “to use the whole of the water naturally passing down the channel,”—of the H’s being “entitled to use but half the water naturally flowing along the channel,”—of their duty “to use it as it is accustomed to flow down the channel,” &c.,—language appro-

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priate only to a case where the water in question was recognized as being that which was “accustomed” to flow through the water course under consideration. And what is meant in the text books and adjudged cases, by water *naturally* flowing, and water *accustomed* to flow?

6195 Are not these the terms always used to define the ordinary and proper flow of a natural water course, with no possible reference to the exceptional case, in which

an upper owner happens to have improved the stream from a reservoir of his own?

In 1853, the canal had been in operation but five years. During this time, it is true, the surplus from the summit level had passed down the river to its junction with the canal in the upper basin as it does now, and as the plan of the canal required. Was this sufficient to make it in the eye of the law an ordinary and customary flow? Could even twenty years have created a right by prescription against the State? Could not the State, if it had chosen, and if it had been practicable, stopped at any time this flow through the river and discharged this surplus through some other channel? Who can doubt it? But when the parties got together for a settlement, the occasion had passed for any such belligerent analysis of rights, and probably these considerations were not mentioned or thought of at all. How then can it now be contended that by *accepting* that release the trustees estopped themselves and estopped the State forever from asserting against the Havens or their grantee, that the contribution to the river from the Lockport mills and spillway in 1853, was not a part of its natural and customary flow? This court once said: "It is a familiar doctrine that the State is not embraced within the statute of limitations, unless specially named, and by analogy would not fall within the doctrine of estoppel. Its rights, revenues and property would be at a fearful hazard, should this doctrine be applicable to a State? A great and overshadowing public policy of preserving these rights, revenues and prop-

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erty from injury and loss by the negligence of public officers forbids the application of the doctrine."

*The People v. Brown*, 67 Ill., 438.

On this point, therefore, we conclude, that the Havens release is to be construed with reference to the state of facts or circumstances surrounding the parties at the time it was executed; that in the suit of which it was the final adjustment, they appear to have set up no claim save that of ordinary riparian proprietors, that is to say, a claim to the water as it was accustomed to flow in the natural channel of the Desplaines river; that there never had been a judicial determination or intimation, to the effect that the addition to that customary

6197 flow, produced by the discharge from the hydraulic basin and spillway at Lockport was or had become by lapse of time or contract or otherwise a part of such customary flow in any legal sense, and that there is nothing in the release itself importing any such claim. It seems too plain for argument. One of two things must be true;—either the question was considered by the parties in their settlement, or it was not. If it was *not*, then the acceptance of the release cannot be now set up by way of estoppel to preclude the State or its grantees from raising the point;—if it *was*, then the terms employed conclusively demonstrate, that the Havens did not expressly make and therefore could not be understood as intending to make any such claim.

But be this as it may, even conceding that in 1853 the trustees in treating with the Havens did not choose to notice the distinction between the natural flow of the river and the artificial addition supplied from the canal itself, and were willing to recognize the whole aggregate volume indiscriminately as river water,—such an agreement as that even cannot be construed as contemplating or embracing the unlooked for state of things existing now. They, and nobody then could have fore-

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seen that in the lapse of eighteen years, by a somewhat remarkable and entirely unlooked for train of causes, the long suspended deep cut would at last be finished, the whole system of supply for the summit, Joliet and Channahon levels totally revolutionized; and the Des-plaines in its character as a feeder completely wiped out from the map. The first canon of construction in expounding contracts, and the one which really involves all others, is to get at the intention of the parties. To do this, the courts place themselves “as far as possible” in the position of “the parties when they made the contract, by possessing themselves of the circumstances  
6198 which they had in view during the negotiations.”

*Stout v. Whitney*, 12 Ill., 227.

*Wilcox v. McGhee*, 11 Ill., 381.

*Hadden v. Schoutz*, 15 Ill., 582.

Now waiving all advantage from the rule that grants are to be taken most strongly against the grantor, and the equally familiar rule that in favor of the Government even its own grants are to be construed strictly as

against the adverse party and favorably for itself, let us place ourselves in the canal office in 1853. The Desplaines was not much of a stream, but the trustees wanted to control it as a feeder for whatever it was worth, without the liability of incessant lawsuits. The Havens making their appearance before the board in a simple character of riparian proprietors on the east bank, as holding title to lot 1, block 57, School Section Addition to Joliet, agree to execute a perpetual release of damages for \$3,000. Suppose the president of the board had said—"Perhaps the State may in a few years finish the deep cut, supplying, say, 25,000 cubic feet of water per minute, enough for navigation and an immense surplus besides for water-power at Lockport and Joliet. Now if in this event she shall turn over Dam No. 2, into your mill pond, or at least double the quantity of water you are getting now, and probably ten times what you got before the canal was opened, thus converting your little mill into first-class property, do you mean to sue anybody for *damages*, should our successors, the Canal Commissioners, find it expedient to use the rest of the water somewhere on the Channahon level?" Judging from this paper and the attendant circumstances, what likely would have been their answer? Tenacious as they had been of their rights, they had never put forth a claim so absurd as this. They had never claimed a foot of water to which they could not show themselves entitled as riparian proprietors by the strict rules of the common law. They had never sought to recover damages for diverting a foot of water which could not be legally defined as water "accustomed" to flow in the Desplaines river. Their answer assuredly would have been: "We convey to you our rights, such as they are, in the Desplaines as a feeder. You are of course at liberty to use it as a feeder as long as you choose, and to dispense with it whenever you choose, it is immaterial to us. If at some future time you or the State should abandon the present system altogether, so that instead of the river feeding the canal, the canal should incidentally feed the river, largely augmenting its flow, and enhancing our water-power, we shall be duly thankful for such good fortune, and will give you bond and security never to bring suit against anybody for such a blessed *diversion* as that."

It is indeed hard to deal with a claim so provokingly absurd and unjust with equanimity and decorum, especially to one who has watched the water flowing over Dam No. 2 for thirty-five years, and seen the advancement of this poor, forlorn Havens mill to its present condition. Here the State of Illinois at an enormous expense has made this great improvement for the general good. The canal at best has a hard time of it to get along, and sorely needs every dollar of revenue it can obtain from every source. It now happens to possess a large surplus

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of water which is available with profit for hydraulic power. The fall of the canal is such that it can be repeatedly used, first at Lockport, again at Dam No. 1, and finally at Dam No. 2. After the experience of a few years, the commissioners have discovered that the amount of water at their disposal at Joliet is so great, that after leasing all that can possibly be leased to advantage at the dam, and after sending down to the appellee's mill double the amount he had ever received before, there is still a considerable surplus that can only be utilized at all on the plan here brought to the notice of the court. Instead of leaving it as a monopoly in the hands of Adam and the several lessees at Dam No. 2, limiting the area of manufacturing establishments in Joliet to *their particular* district, this scheme operates to distribute the benefit of this hydraulic power over territory well situated for such industries, adjoining the west bank of the canal for a long distance, perhaps a mile or more. But now this appellee, equally grateful and modest, comes into court and claims, that the water is *his*, and that the water rents must be paid to *him*, instead of going into the coffers of the state. He hardly pretends that the millions that were expended on the works, through which Lake Michigan rolls down to Joliet, were altogether contributed by him. He generously leaves to the state undisturbed the responsibility and expense of repairing, maintaining, superintending and operating the canal. For his own part he is content with the humble post of gobbling up the accruing revenues.

For the reasons, thus presented at length which only the importance of the case could justify, we respectfully

submit, that the judgment of the Appellate Court ought to be reversed.

G. D. A. PARKS,  
E. F. BULL,  
*Attorneys for Appellant.*

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IN THE SUPREME COURT OF ILLINOIS,

Northern Grand Division.

September Term, A. D. 1881.

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WM. DRULEY, *Appellant*,  
*vs.*

WILLIAM ADAM, *Appellee*.

Appeal from Appellate Court of Second District.

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ADDITIONAL BRIEF FOR APPELLANT.

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We think in our former brief that we have shown, both upon principle and authority, that a riparian proprietor on a natural water course is entitled, and *only* entitled, to receive from the proprietor above *the proper, natural and customary flow of the stream, unimpaired in quantity*, and in the condition of fall necessary to make it reasonably useful to him; but this rule applies only to the water *naturally and customarily* flowing in the stream. It will, perhaps, in this connection be advisable for us to review more fully than we have the

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6204 authorities which were relied upon by counsel for appellees in the Appellate Court, and to consider some of the positions there assumed by them.

I.

Appellee in the Appellate Court made the proposition that "a lower riparian proprietor has the right to the use of all water which may be added to a stream by a



higher proprietor, no matter for what purpose, and it matters not that the addition was made at the entire expense of the upper proprietor and withdrawn before reaching the land of the lower," and in support thereof cited several authorities to which we desire briefly to call the attention of the court. It seems to us that none of them are applicable to the point made in the case at bar.

*Tourtolotte v. Phelps*, 4th Gray, Mass., 370, turned entirely upon the construction of certain deeds of conveyance, and the question in the case is expressly stated to be "the extent of the defendant's right at his shop" under certain deeds of conveyance introduced in evidence. The defendant in that case did not seek to assert nor claim the right to withdraw from the stream water he had added thereto, nor was that question in the case, either directly or indirectly, nor has that court in that case attempted to pass upon this question. The nearest approach in the opinion to the question urged by ap-  
6205 pellee will be found on page 376, and is as follows:

"One consideration is important to the present inquiry: It is this: That as each proprietor through whose land a water course passes has a right to the natural flow and descent of the water course subject to the like reasonable use by all others, he *necessarily* enjoys the

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benefit of any improvement made by the proprietors above him. If they increase the head waters for useful purposes by *flowing increased areas of land* and by making reservoirs to preserve surplus waters for dry seasons, and thus increases the volume of water for hydraulic purposes, every lower proprietor *necessarily* enjoys the benefit of it; but in such case no mill owner below the first and nearest the meadow or land flowed can be liable to the land owner for damages. He has done the land owner no wrong by having the increased volume of water at his works, whether he uses it or not; such increased volume of water was inevitable by him; he hadn't caused it, and could not prevent it. He would not be responsible to the land owner for damages caused by flowing his land, because it was not caused by his dam, but by some one above him, for whose doing he would not be responsible."

*The improvements here spoken of are not those caused*

by an addition to the waters of the stream from other sources, but simply consisted of the construction of reservoirs whereby the surplus water was preserved for dry seasons. Of course the lower riparian proprietors necessarily enjoyed the benefit of the reservoirs constructed above to retain the waters for the seasons of drought. The upper proprietors could not, from the nature of the case, enjoy the benefits of their improvements without conferring corresponding benefits on those below them. One of the questions in the case cited was as to the liability of the defendant for the overflow of a certain meadow land belonging to the plaintiff. It was held that the defendant was not liable, *although* he used the water thus held back and preserved by the dam, for the reason that it was not his dam that penned up and flowed back this water, but the dam of the upper proprietor. It was true that *he* de-

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6206 rived a benefit from the construction of this dam and the preservation of the surplus waters; but he did not build the dam nor in any manner aided in its construction, and it was therefore held that he was not liable for the damages caused by this overflow. Upon the same principle it can be asserted that the appellant here is not liable, even if, as between appellee and the state, appellee is entitled to the waters brought through the deep cut at the summit level, for it was not appellant's dam that caused a diversion of the water from the Desplaines river into the canal, but it was the dam of the people of the State of Illinois, the owners of the canal; and at the point where 6207 appellant drew this water from the canal the water was in the absolute and undisputed possession of the state and subject to the control of the Canal Commissioners, and subject to that control, too, not by reason of any act or assent on behalf of the appellant, but by reason of an act of the Canal Commissioners, for which he was in no manner responsible.

The next case cited by appellee in the Appellate Court in support of his claim to the water procured through the summit level from Lake Michigan was *Webb v. Portland Manufacturing Co.*, 3 Sumner, p. 189. There were but two questions in that case, and I quote from the opinion of the court, page 191:

"The first is whether to maintain the present suit it is essential for the plaintiff to show any actual damage. The second is whether in point of law a mill owner having a right to a certain portion of the water of a stream for use of his mill at a particular dam has a right to draw off the same or any less quantity of the water at a considerable distance above the dam without the consent of the owners of other mills on the same dam."

It will be seen that neither

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of these questions affects the question at issue, nor is the question at issue in any manner discussed in the opinion.

6208 It was held in that case that the defendant by drawing off the water, to which he claimed to be entitled, from the pond at some distance above the dam, necessarily decreased the amount of the head which the mill owners located at the dam would otherwise have, and to that extent they were injured, and for such injuries were entitled to maintain their bill. It was also claimed in that case that the defendants had fully indemnified the plaintiff from injury, and in fact conferred a benefit upon him by creating a reservoir higher up the stream so as to be capable of affording a full supply in the dryest seasons: but it was held that the plaintiff had no interest in such dam, could not compel its maintenance, nor could he be compelled to take any benefits that he might necessarily derive therefrom in lieu of his natural right to a full head of water at his dam.

The third case relied upon is that of *Swindon Water Works v. W. & B. Canal Co.*, 14 Moaks, (Eng. R.), 86, but that case has not the remotest analogy in any respect to the case at bar. The Swindon Water Works Company claimed the right as upper proprietors of the stream to divert all the water for the purpose of supplying the town of Swindon, and by this means prevent any portion thereof finding its way to the lower proprietor, which the English House of Lords very properly held they had no right to do.

6209 The next case cited is that of *Batavia Manufacturing Co. v. Newton*, 91 Ill., 230. But no such question was before this court in this case, nor did this court even by way of argument say anything in that case that can be

properly construed in support of such a proposition. The only con-

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tention between the parties was as stated by Mr. Justice Scholfield (page 234):

"The plaintiff claims a preference of twelve hundred square inches, while the defendant contends that it is entitled to but six hundred square inches. The ruling was in favor of the contention of the defendant."

And the settlement of this question depended entirely upon the construction of certain deeds of conveyance which had been introduced in evidence and formed a part of the record.

By way of illustration, Justice Scholfield uses the language relied upon by appellee, page 241; but the court will see that the *illustration* is with reference to water that was supposed to have been added to the natural stream, had commingled therewith and had reached the joint possession of the riparian proprietors at their common dam, and simply asserts that such contribution was to the common pond, in which each were jointly interested, and that such fact would not entitle the person supplying the same to a PREFERENCE IN ITS USE AT THE DAM; but even that question was not before the court in that case, much less can it be claimed that this illustration supports the claim made that if an upper riparian proprietor has added to the natural waters of a stream by artificial means, and for his own purposes, he has no right, for his own use, to withdraw the same or a like quantity from the stream before it reaches the possession of the lower proprietor.

The next is that of *Eddy v. Simpson*, 3 Cal., 249, and comes nearer than any other case cited in support of the proposition contended for. but still, when carefully considered, falls far short, and unfortunately for the appellee has been expressly held by later cases in the same court not to bear the construction sought to be placed upon it, and if ca-

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pable of bearing such construction, has been expressly overruled by the cases heretofore cited by us. In that case it was held that the water which it was sought to withdraw from the stream had, without the agency of the

defendants found its way into Shady Creek, *joining the waters then in the possession of the plaintiffs, and became a part of the body of water used and possessed by the plaintiffs*, that the defendants had abandoned the water and lost all right therein, and therefore had no right, *after it had come into the possession of the plaintiffs*, to withdraw the same from the plaintiffs' possession. It seems to us that if it was true, as found in the case last cited, that the waters had been abandoned by  
6211 the defendant and allowed without his agency to flow into possession of the plaintiffs, that the defendant would have no right, either natural or legal, to withdraw the same from the possession of the plaintiff. And this concession in no manner militates against the claim made by us. Here the water was withdrawn by the party who supplied the same *before* it came into the possession of the plaintiff. What he complains of is that the water *was not permitted to come into his possession*.

It was claimed by counsel for appellee in the Appellate Court, and will undoubtedly be insisted upon here, that the California cases are not of a general applicability for the reason that they are, as it is claimed, founded on the situation of the parties and the customs and laws of California. From the peculiar situation of many of the water rights in California, the precise question at issue has arisen more frequently in that state than in all other localities combined; but the Supreme Court of California distinctly assert that they base their opinion *upon common law principles*, applying to the

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peculiar condition of things in California well established rules of the common law. At common law a person in order to be entitled to the use of water in a running stream must be a riparian proprietor; that is, he must own the soil upon either one or both of the banks of the  
6212 stream, and unless he was such owner he had no right to claim any interest in the use of the water, unless such interest had been acquired by grant or prescription. In California, however, in most instances the fee to the streams at the time this question arose was in the Government. Strictly speaking, there were no riparian proprietors except the Government, but from the earliest settlement of the state the person who, for the purpose of

operating mines, or for irrigation, first dammed up and controlled the waters of a stream was treated and considered as having a proprietary interest in the use of such water as against all persons other than the Government, or those claiming under the Government. The development of the mines of California required the protection of parties who had expended large sums of money and a large amount of labor in controlling for useful purposes the waters of a running stream. And so the courts, applying common law principles to the existing state of facts, say that they will treat the first appropriator of the waters of a running stream, in all cases where the Government is the proprietor, as the person entitled to the use of such waters; and this, too, notwithstanding he may have no interest in the soil over or through which the stream runs. Such ruling was a proper application of well established rules of justice to the state of facts there found to exist. Such being the  
6213 case, and the first appropriator of the waters of a running stream being treated and considered as the true owner thereof, so far as the use of

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such waters was concerned, the question in the case cited by us from California arose, and as the Supreme Court of California say, by the application of common law principles they find that a person who has added to the waters of a stream may draw from such waters a like amount. The only departure from strict common law principles being in treating the first appropriator of the waters of a stream as the true riparian owner as against all persons except the Government and those claiming by grant from the Government, such persons so treated as the true owners being entitled to the *same* rights to be determined in the *same manner* as persons who are riparian proprietors at common law.

## II.

We desire also to call the particular attention of the court to the facts appearing in several of the cases referred to in our former brief; but, before doing so, will state as a proposition which we think is fully sustained by the authorities, that in no case is a party liable to a

lower land owner for diverting water if actual damage has not been done.

- 6214     *Wadsworth v. Tillotson*, 15 Conn., 366.  
           *Gillet v. Johnson*, 30 Conn., 180.  
           *Seeley v. Brush*, 35 Conn., 419.  
           *Chatfield v. Wilson*, 31 Vt., 358.  
           *Gerish v. New Market Mfg. Co.*, 30 N. H., 478-483.  
           *Pollitt v. Long*, 58 Barber, 20.  
           *Dilling v. Murray*, 6 Ind., 324.  
           *Williams v. Mooreland*, 2 Barn. & C., 910.  
           *Mason v. Hill*, 3 Barn. & Add., 304.  
           *Mason v. Hill*, 5 Barn. & Add., 1.  
           *Embry v. Owen*, 6 Ex., 358.  
           *Wood v. Wadd*, 3 Ex., 748-781.  
           3 Kent Com., 441, note 1, 12th Ed.

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- Of course this rule does not apply if there has been such a diversion of the water as would, if persisted in for twenty years, grow into a prescriptive right to the use of the water thus diverted, to the prejudice of the lower proprietor, for in such case the law implies damage, though none be shown. We do not contend that a lower riparian proprietor is bound, in order to be protected in his rights, to be in the actual use of the water power. The doctrine seems to be well established that an *improper or unreasonable* diversion of the NATURAL waters of a stream works an injury to the lower proprietor, even if he is not in a condition at the time of such
- 6215 diversion to apply the water to his own use, for the reason that such diversion, if continued in for a period of twenty years, may result in a prescriptive right to his prejudice. But this rule only applies to the NATURAL waters of the stream, and it *only applies in cases where the diversion is an unreasonable one*. This doctrine seems to be conclusively settled by Chief Justice Shaw, in *Elliott v. Fitchburg R. R. Co.*, 10 Cush., 191. In that case one Clark was an upper, and Elliott, the plaintiff, a lower riparian proprietor upon a stream. Clark had deeded to the railroad company a perpetual right and privilege to make and maintain a dam and reservoir on this stream and to draw and use the water therefrom. In pursuance of the right thus conveyed the railroad company had erected a dam across the stream below a spring on Clark's land, by such dam had made a reservoir



and inserted a pipe therein from which they took the water from the reservoir for the purpose of supplying their depot at Sherly, and used the same in supplying their locomotives, and for other similar purposes, the defendants proved that Clark's meadow, through which the creek run, was wet and springy, and that

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he had cut ditches across the meadow to the brook, *thereby increasing the flow of water to the brook; and it was further proved that there is no outlet for the water of said meadow, except into the brook, and that the meadow*  
6216 was situated below the dam. Page 102.

"The plaintiff contended that if the jury were satisfied of the existence of the brook as alleged, and the diversion of the water therefrom by the defendants, he was entitled to a verdict for *nominal* damages without proof of *actual* damage; but the presiding judge instructed the jury that unless the plaintiff suffered *actual* damage in consequence of the diversion, the defendants were not liable in this action. *In connection with this instruction the judge further instructed the jury that if they believed that the defendants by excavating said reservoir, and spring above the dam, or that said Clark by digging said ditches had increased the flow of water in said brook equal to the quantity of water the defendants had diverted therefrom, then the defendants were not liable in this action.* The whole court are of opinion that this direction was right in both particulars."

It has been suggested by counsel for appellee that this case was determined upon the peculiar statutes of the State of Massachusetts in relation to mill rights. In this counsel are in error. The court say, after having considered the question raised upon the first direction to the jury, (that is, that the plaintiff must show an actual damage in order to be entitled to recover):

6217 "We consider the other direction correct also, as we understand it. The question was not (if the defendants have caused damage to the plaintiff amounting in law to a disturbance of his right, for which an action would lie) whether it would be barred by an advantage of equal value conferred in the nature of a set-off, *but whether the*

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*improvements of Clark upon his meadow taken together*

*as a whole, including the dam and ditches as parts of one and the same improvement, any damage was done to the plaintiff; and this we think was correctly so left.*

It may, perhaps, be proper to guard against misconstruction in considering what are the general rights and duties of persons owning lands bounding on running streams by the general rules of law and for general purposes, that some alterations of these rules may be effected in Massachusetts, by the act of legislation on that subject in respect to mills, and the constructions which have been judicially put upon such legislative acts.

\* \* \* It is not necessary, however, to go into this subject, but merely to say that the rights to streams of running water upon which the present question turns *are not dependent upon or affected by the mill acts.*"

It was insisted by the counsel for appellee in the Appellate Court that the case of *Whittier v. Cocheco Mfg. Co.*, 9 N. H., 454, was not in point, for the reason as contended that the manner of the enjoyment of the water by the defendants was consistent with the manner in which they had used the same for fifty years, and that they were not obliged to pen it back for plaintiff's benefit. The case will be better understood by the following diagram?

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The Cocheco river runs, as we understand the case, in an easterly direction from its source to its mouth. At the point designated Waldron's Falls there was a dam, and on the northerly side of the river the defendants and their grantors had, for a period of fifty years, been in the enjoyment of a certain water power privilege. On the southerly side of the river the plaintiff, by virtue of the conveyance to him, became seized of a water power privilege, under which he was entitled to a portion of the water formed in the mill-pond above the dam that furnishes the water power under which the defendants claimed. Under these circumstances the defendants, to increase the flow of water to their water privilege, had constructed a reservoir at Bow pond, some distance above the dam, at Waldron's Falls, and in this reservoir the water was dammed back and kept for use during a season of low water. Subsequent to the time that the plaintiff acquired his water power privilege at the southern end of the dam, and subsequent to the construction of the reservoir by the defendants at

Bow pond, on the northerly side of the river, the defendants purchased certain cotton mills at a point about three miles lower down the river, at which point they constructed another dam for the purpose of supplying their cotton factory with water power, and during low stages of water opened their gates at the dam at Waldron's Falls and allowed the water, which they had penned back in the reservoir at Bow pond, to flow past the dam at Waldron's Falls to the dam at their cotton factory and use the water at the latter point. The action was commenced in 1831. It appeared from the evidence, first, that the defendants and their grantors had for more than fifty years used a portion of the water of the Cochecho river.

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at Waldron's Falls at the northerly side of the dam. It further appeared that in February, 1819, twelve years before the action was commenced, the plaintiff's grantors became seized of a certain mill privilege at the south end of the dam. It further appeared that the reservoir at Bow pond was constructed in 1825, *several* years after plaintiffs' grantors had become seized of the water power privilege at the south end of the dam at Waldron's Falls; and at this time the defendants and their grantors used the water power privilege which they were entitled to at the northerly end of the dam at Waldron's Falls, so that the reservoir, which supplied the additional water power in seasons of drought, was constructed after the rights of the plaintiff had accrued, and the attempt to use the water thus dammed back at the cotton factory, three miles below Waldron's Falls, was not made until long after the plaintiff or his grantors had acquired their water power privilege. The court held that the defendants had a right to open their gates at Waldron's Falls and to allow the water to which they were entitled, and the water which they had supplied to the stream by means of the reservoir at Bow pond, to flow down past the dam at Waldron's Falls to their cotton factory three miles below; provided, of course, that they use no greater quantity than they would have used but for such change in the location of the place where the same was used. We can do no better, upon this subject, than to quote from the opinion of the court, page 458:

*"The next question rises upon the instruction to the jury, that the defendants might draw through their gates in dry seasons even a larger quantity than they had been accustomed to draw prior to 1828, if the excess was furnished by themselves by means of a reservoir they had constructed above."*

The court will see that, as the action was commenced in

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6221 1831, no right by prescription existed to this excess of water. It depended entirely upon the legal right of the defendants to use water which they themselves had provided, and by their own means had added to the waters of the stream. On page 459 the court continues:

6222 "This part of the case depends upon some special circumstances, probably not often existing. The defendants appear to have provided a supply of water at Bow pond, the outlet of which empties into the Cocheco river, for the use of their factories in time of drought. There is no complaint that in making provision for this supply they have infringed any rights; if there was, it could not be tried in this case. In order to use this water at their factories in Dover it must pass Waldron's Falls, and the question is whether the defendants are obliged to shut their gates at that place so that the plaintiff may have the use of the additional water thus provided as it passes those falls, or to use it in part themselves there in order that the plaintiff may use it with them, or whether they may suffer their gates to stand open, and this additional water to pass without use by any one. On the case before us, the plaintiff has no right to have this water pass Waldron's Falls. The defendants may pen it back and permit it to evaporate without suffering it to come into the Cocheco river. It is derived from a reservoir provided by them for their own purposes, and the plaintiff can maintain no action for depriving him of the use of it in that mode. On what principle, then, is his right infringed if they let the water into the river, hoisting their gates at Waldron's Falls and permitting it to pass by? On what ground are they obliged to pen it up there for the plaintiff's benefit? Suppose, instead of a mill the plaintiff was the

owner of a meadow lying upon the Cocheco above Waldron's Falls, which in or-

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dinary stages of water, in the summer, prior to the construction of the reservoir at Bow pond, had not been affected by the water, and that if the defendants were now to let the water out of the reservoir in the summer and pen it up by the dam at Waldron's Fall until they had occasion to use it for their works there, the plaintiff's meadow would be overflowed thereby and injured, he would most clearly have a right to complain of that, and his complaint would be in substance that the defendants did not open their gates and let the water pass, but by means of their dam they threw the water back upon his land. This may serve to show that he cannot object to the act of the defendants in drawing the water through their gates, unless he can show a right to the use of it and a duty upon the part of the defendants not to deprive him of that use. As the owner of a mill site on the river, *he would have been entitled to the use of it from the mere fact that it run in the channel*, HAD NOT THE DEFENDANTS PROVIDED IT AND TURNED IT INTO THE RIVER FOR THEIR OWN USE."

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And, again, page 461:

"We have considered this case as if Watson & Son (the plaintiff's grantors), when they conveyed in 1819, could grant the right to use the southerly end of the dam all the water ordinarily running in the stream beyond the quantity which the defendants and those under whom they claim had been accustomed to use on the northerly side."

So the court will see that this case is directly in point and fully sustains the claim we make. It did not turn upon the fact that the defendants had by use acquired a right to the water in the stream to the exclusion of the plaintiff, but the plaintiff was treated as being entitled to a portion of the

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water running in the stream for his mill site at the southerly end of the dam at Waldron's Falls, and it is expressly held that he has no right to complain of diversion of water from this stream, and a refusal to permit it to pass over the dam at Waldron's Falls *in case such water has been supplied by the defendants*.

The case of *Society for Manufacturing v. Morris Canal Co.*, Saxton (N. J. Ch.), 157, is so nearly identical in all particulars with the case at bar that we feel justified in quoting therefrom more fully than in our former brief. We desire here to say there is nothing in *that* case, as claimed by appellee's counsel in Appellate Court, 6224 from which it can be inferred that the Canal Company used the Rockaway as a part of their canal the *whole* distance from the points at which the waters of Lake Hopatcong and Green pond were brought into the Rockaway to the point where the same was withdrawn for canal purposes. As these points were necessarily distant from each other, the *probabilities* are that the water from either one or the other, or perhaps both of these sources, was introduced into the Rockaway at a point where the Rockaway itself was *not* used as a part of the canal, but we apprehend on principle it can make no difference how this fact is, *the important inquiry is, were such waters introduced by the SAME PERSON who, for his own purposes (at a point where he had control of the stream) withdrew the same; and if so, had such person the right to withdraw from the stream as much as he had added thereto?*

The chancellor says, p. 188:

"I now propose to consider the right of the defendants, or how far, if at all, they interfere with those of the complainants; and whether, in the exercise of those rights any injury has been done to the

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plaintiffs, and whether, in the further use of them, the plaintiffs will be so *certainly* and *permanently* injured as to justify the interference of the court at this time by injunction.

6225 "And first as to the rights claimed by the defendants; I do not understand them as claiming a right to the *ad libitum* or unrestrained use of the water of the Passaic or its tributaries, subject to the payment of a compensation or damages to the society for establishing useful manufactures. \* \* \*

"They claim, under the act of incorporation, the right to construct a navigable canal from the Delaware to the Passaic; *they claim the use of the waters of Lake Hopatcong and of the extra water of Green pond; they claim to bring the water from the Hopatcong into the Rock-*

away to make use of that river as part of the canal, and to take out of it again water for the use of the canal—NOT THEREBY DIMINISHING THE ORDINARY AND NATURAL FLOW OF THE WATER AT THE GREAT FALLS OF PATERSON.

"It does not follow that because a person as riparian proprietor has a right to the flow of a stream and to its use for the purpose of manufacturing or any other purpose requiring the use of water, that therefore no other proprietor or person shall be at liberty to use, for the same or like objects, the water above him. This would be contrary to natural justice and the reason of things. Each one has a right to the use, provided that in the exercise of such right he does no injury to his neighbor. 2 Blac. Com., 403.

6226 "Now if the Morris Canal and Banking Company make such use of the waters of the Passaic, or any of its tributaries, as to occasion no DIMINUTION in the flow of the stream at the place

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where it is used by the complainants; and if in such use no injury whatever is done to the complainants, are they not exercising an ordinary and well established right? Does not the same privilege that is accorded to others also belong to them? It appears to me unquestionable that the defendants have such right as against the complainants, subject to the condition already stated.

"But the Morris Canal Company claim the further privilege of introducing into the Rockaway the waters of the Lake Hopateung, and of one of the branches of the Raritan, and then of taking out of the Rockaway below so much water as may be necessary for the purposes of their canal; averring that the waters of the stream will be thereby in no wise diminished.

"The water thus taken out, it is admitted, is not to be returned until it shall have passed the great falls at Paterson. They say that the supply of water thus brought in, together with the extra supply which they are authorized to take from Green pond, will in times of drought afford the society a more copious flow than they would otherwise have, and therefore that it will be a benefit. On the other hand it is contended by the society that 6227 the Canal Company have no authority thus to commingle different streams and different rights; that they are entitled to the flow of the identical stream of water,



not only without *diminution* but without *alteration*; that if the claims of the company in this behalf are sustained, the supply afforded by these substituted streams may in time diminish, and the property and immunities of the company be jeopardized or ruined.

"This is *supposed* to present a question of *novelty* and *importance*. It certainly is *not* the case of a *simple diversion*

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of the stream for necessary purposes, returning it again to its natural channel when those purposes shall have been answered; but would seem to be rather a *substitution of part of one stream for part of another*. The principle that assigns, to everything capable of ownership a legal and determinate owner, is wise and salutary and productive of great ends of civil society. This principle, however, can only be applied to streams of water in a limited sense. *There is no such thing as actual property in running water*. It is transient in its nature and must be permitted to flow for the common benefit. The interest is rather of a *usufructory* kind, but not the less absolute or vested on that account.

6228 "To say, then, that a person entitled to the flow of a stream through his land, is entitled to the flow of the *very identical substance* that issued from the original source, is an assertion of right not easily sustained. *It would be tantamount to the ownership of the particular water itself, which cannot be*. I do not understand Lord Ellenborough, in *Bealy v. Shaw*, to carry the doctrine thus far. His principle is, that every man has a right to the advantage of a flow of water in his own land, *without having its QUANTITY diminished, or its QUALITY altered by the operations of those who might be above him on the same stream*. *It is not pretended that the QUALITY of the water to be let in from Lake Hopatcong and other sources is in any way different from the water of the Rockaway*. IF THEN THE DEFENDANTS TAKE FROM THE ROCKAWAY NO GREATER QUANTITY OF WATER THAN THEY BRING IN, (and they claim a right to do no more,) WILL NOT THE SOCIETY ENJOY THEIR PRIVILEGE WITHOUT DIMINUTION OR ALTERATION, OR CAN THEY IN ANY WAY BE INJURED?"

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This case, as the court will see, was decided upon the

6229 exact principle we contend for. It did *not* turn upon the fact that the Rockaway was used as a part of the canal the entire distance from the point where the water was introduced to the point where it was withdrawn. Indeed, there is nothing in the case to indicate that the *bed of the stream* was used as a canal at all, but the indications are that the sense in which the court speaks of the claim made by the Canal Company to the use of that stream as a part of the canal, *is its use as a feeder*, for in reading the statement of the case and the extended and able argument of the counsel, it will be found that it is *nowhere* stated that the bed of the stream was used *as a part of the bed of the canal*. On the contrary, Mr. Wood, of counsel for the Society, claimed, p. 167, that the Canal Company could have accomplished their purposes and avoided all trouble *by passing the water from Lake Hopatcong and other sources over the Rockaway in an aqueduct*, and this claim seems to have been acquiesced in by all the counsel on both sides.

6230 The California cases already referred to establish the right of the Canal Commissioners to the surplus water turned into the Desplaines from Lake Michigan as clearly and conclusively as it is possible for that right to be established by the uniform decisions of any one court. The opinions of this court have always ranked high with the profession, and one of them was rendered by Mr. Justice Field, now of the Supreme Court of the United States, whose reputation as a learned jurist is second to none, and it would seem upon principle that as a riparian proprietor is *only entitled to the water that naturally runs in the stream*, that he has no right to complain if an upper proprietor takes from the stream a like or less quantity than that which he has added thereto.

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The same question has been since repeatedly reaffirmed by the Supreme Court of California.

### III.

The State of Illinois by making the deep cut at the summit level has caused the waters of Lake Michigan to flow directly through that deep cut into the canal. This water, as the act shows, was brought from Lake

Michigan in pursuance of the original plan for the construction of the canal, and one of such purposes always has been to supply water for manufacturing purposes in case a surplus of water is found in the canal for that purpose; and all of the acts of the Legislature recognize this fact and impose upon the Canal Commissioners, and have for all time, the duty of realizing as large a revenue as possible from this source for the purpose of keeping up and maintaining the canal. This water from Lake Michigan is turned into the canal and into the Desplaines river by artificial means, and is, at least until it arrives at Lockport, an artificial water course, entirely within the control of the Canal Commissioners, subject to be by them diverted in such a manner as the law may authorize, or as they shall deem best for the interests of the State, and for such diversion, no matter  
6231 whether made for the purposes of supplying the canal with water or for the purpose of furnishing power for manufacturing purposes, the appellee has no right to complain, and would have no such right if the Canal Commissioners should by an artificial channel receive the water at the place where it is discharged through the Norton mill-race, and conduct the same in an artificial channel to the canal, or to the point where the river and canal are united.

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We don't understand that appellee's counsel insist that in such case they would have any right to complain. In other words, they concede the right of the Canal Commissioners to divert this surplus water from Lake Michigan at any point BEFORE it reaches the Desplaines River, but insist that it cannot be diverted after it has reached the bed of that stream. We can see no difference in principle between the diversion *before* and a diversion *after* the waters have reached the Desplaines River, provided always this diversion is made before the artificial waters thus commingled with the natural waters of the stream came into possession of appellee. This artificial water is added to the stream, not for the benefit of appellee, but for the benefit of the canal and for canal purposes. They were withdrawn from the stream by the same party that supplied the same and for legitimate purpose. It has even been held that the right of prescription cannot be asserted in favor of the use of

6232 such water, but that the original proprietor may alter the course at any time to suit his pleasure, even after a period of twenty years.

*Greatrex v. Hayward*, 8th Exc. (W. H. & G.), p. 292.

*Wood v. Waud*, 3 Exc., 748.

Washburn on Easements, X, pp. 294-6.

*Arkwright v. Gill*, 5 Mees. & W., 203.

*Greatrex v. Hayward*, 8 Exc. (W. H. & G.), p. 290.

*Wood v. Waud*, 3 Exc., 748.

Angell on Water Courses (6 Ed.), Sec. 206.

But the upper proprietor may acquire an easement to the flow of an artificial stream over the lands of a lower proprietor, and this, too, although the lower proprietors has no right to demand that the artificial water course should be maintained.

Angell on Water Courses (6 Ed.), 206A.

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*Rawstron v. Taylor*, 11 Exch., 378.

*Broadbent v. Ramsbotham*, id., 610.

*Solomon v. Vintner Co.*, 4 H. & N., 593.

*Sampson v. Hoddinott*, 1 C. B. N. S., 590, 606.

In such case the upper proprietor would not be liable for a diversion of the water formerly running in the artificial water course.

*Rawstron v. Taylor*, *supra*, which is a leading and important case on this subject.

6233 Counsel for appellee in the Appellate Court seemed to rely upon the case of *Wood v. Waud*, 3 Exc., 748, as establishing their right to the water added to the Desplaines River from Lake Michigan through the deep cut in the canal.

This book is not to be found in the library, but a full report of the case will be found in Washburne on Easements and Servitudes (2d Ed.), p. 370, star p. 297, from which we cite as follows:

"In *Wood v. Waud*, 3 Exc., 748, the plaintiff and defendant each had mills upon a small natural stream. A part of the supply of water for these was derived from two different mines, from one of which a stream had flowed for sixty years by means of an artificial outlet dug by the owner of the mine for the purpose of draining his mine. From the other mine a stream of water flowed which was caused by pumping. These streams flowed through separate sloughs into the natural stream.

One of these passed underground through the defendant's land before reaching the plaintiff's land, and then through that into the stream. The other did not pass through the plaintiff's land at all before reaching and discharging itself into the stream.

The action of the plaintiff was for diverting, or im-

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properly interfering, by the defendant, with the enjoyment by the plaintiff of water flowing from these sloughs.

6234 Whatever he did in this respect was done upon his own land, before they had entered and united with the waters of the natural stream, and before the water of the slough that run through the plaintiff's land had reached the latter.

The court held that if the mine owner had seen fit to stop the supply of water, or divert it, so that the water from the mines should no longer reach the works of the mill owners, he would not have been liable therefor, adopting the doctrine of *Arkwright v. Gell*. As between the plaintiff and defendant no prescription had been set up or relied on on either side, neither had any right to complain of any use which the other should make of the water on his own land, before it reached that of the other, provided he did not foul it or turn it into the stream heated so as to injure the party below. 'Each,' in the language of the court, 'may take and use what passes through his land, and the proprietor below has no right to any part of that water until it has reached his own land. He has no right to compel the owners above to permit the water to flow through their land for his benefit, and consequently has no right to action if they refuse to do so. \* \* \*

6235 If they polluted the water so as to be injurious to the tenant below the case would be different.' But as soon as the water from either of these sloughs had become united with that of the natural stream in its natural water course it partook of the character and incidents of a natural stream. Pollock, C. B., in giving the opinion of the court in the above case, gives, as an illustration of the doctrine which he sustains, the case of a drain made through a man's land for agricultural purposes, which

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had continued for twenty years, whereby the water from his own land was discharged upon that of another. This

would not give a right to the latter to insist upon its continuance and thereby to preclude the land owner from altering the level of his drain for the greater improvement of the land. The state of the circumstances in such cases shows that one party never intended to give nor the other to enjoy the use of the stream as a matter of *right*."

"The above makes this important distinction between the right of the lower riparian proprietor to water flowing in a natural stream and to that created and flowing in an artificial one for a temporary purpose, that in the former case an action will lie for its diversion by an upper proprietor, although done on his own land, whereas in the latter case no action will lie for the diversion of the water unless the same shall have reached and become part of a natural stream."

6236 From this it will be seen that the question at issue was not presented in that case, and so far as it goes it is an authority in our favor.

It establishes conclusively our right at least on our own land, to divert the waters of our artificial water course.

But the artificial waters considered in this case were not contributed by *either Wood or Waud*, but by *another, who was not a party to that suit*. So that while it may be true that as between Wood and Waud *neither* would have had the right to withdraw from a natural stream water, or a like quantity of water, that had been added thereto by *another*, this case does not decide that if *either* had added artificially to the waters of a stream that he might not, on his own premises, withdraw a like quantity.

If, in that case, artificial water had been added to the nat-

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ural stream by means of an artificial channel by the defendant for his own purposes, and for his own use withdrawn from the natural stream before it reached the possession of the plaintiff, and, if, under such circumstances, the court had held that he had no right so to do, the case might support the position assumed by appellee; but as it is it falls far short of so doing. The most that can be claimed on the strength of that case is that the defendant would not have the right of withdrawing,

6237 to the prejudice of the plaintiff, water that had been supplied to the natural stream by a stranger to him, neither at his request nor through his agency; that is, the stranger who thus added to the waters of the stream by artificial means, not seeking to withdraw it for its own use, had abandoned it for the use of the several riparian proprietors, and for that reason the several riparian proprietors were interested therein to the same extent as if supplied from natural sources, the stranger, however, being at liberty to divert the artificial stream at any time. It was his water, and he had a right to permit it to flow into the natural stream, or elsewhere, as he saw fit.

## IV.

Appellee claimed in the court below that no water had been added to the River Desplaines by appellant or those from whom he claims; that the water which was added was by virtue of the improvement of the summit division of the canal; that the purpose of this improvement was *not* to supply water to the canal, etc.; and in support of the position thus assumed, counsel cited *a portion and a portion only* of the preamble of the Act of 1865, under which the deep cut was made.

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6238 The portion cited read as follows, viz.: "Whereas, it has been represented that the City of Chicago, in order to purify or cleanse Chicago River by draining a sufficient quantity of water from Lake Michigan directly through it and through the summit division of the Illinois and Michigan Canal, would advance a sufficient sum of money to accomplish this desirable object." Here ends the quotation, and counsel in commenting on it say this showed the object of the act to be to purify the Chicago River and to accomplish *this end* water was to be drawn through the summit division of the canal.

It is evident the Appellate Court did *not* read the act or the preamble thereto, but took it for granted the quotation was the *whole* of the preamble, and hence was led into error as to the true object of the passage of that act.

If the *sole* object of making the deep cut was to drain Chicago River, there would be some force in the position taken; but even then, if the water was resumed



before it passed to the point where appellee was entitled to use the same, no action would lie therefor. But it is hardly necessary to discuss that question, as a perusal of the whole preamble and the act itself shows that the object of making this deep cut was to supply the canal itself with water from Lake Michigan.

The whole preamble is as follows:

6239 "Whereas, it has been represented that the City of Chicago, in order to purify or cleanse Chicago River by drawing a sufficient quantity of water from Lake Michigan directly through it and through the summit division of the Illinois and Michigan Canal, would advance a sufficient amount of funds to accomplish this desirable object; and whereas, the original plan of said canal was to cut down the summit so as to draw a supply of water

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for navigation directly from Lake Michigan, which plan was abandoned, for the time being, after a large part of the work had been executed, ONLY in consequence of the inability of the state to procure funds for its further prosecution; and whereas, under the law creating the trust, the plan of the summit division of the canal was changed, the level being raised so as to require the principal supply of water to be obtained through the Calumet feeder, subject to serious contingencies, and by pumping onto the summit with hydraulic works at Bridgeport; now, therefore,

Be it enacted &c. Sec. 1. That to secure the completion of the summit division of the Illinois and Michigan Canal upon the original deep cut plan, &c.

Sec. 2. The canal shall be constructed on the plan adopted by the Canal Commissioners in 1836.

Sec. 3. Provides for right of way.

Sec. 4. The amount expended (not exceeding the sum of \$2,500,000 and interest) in deepening summit division on the plan adopted by the Canal Commissioners in 1836 shall be a lien upon the canal and its revenues.

6240 Sec. 5. The State may at any time relieve this lien by refunding to the city the amount expended.

The title to this act, as well as the preamble and the act itself, is worthy of consideration, and shows what the object of the act was, viz.:

"An act to provide for the completion of the Illinois

*and Michigan Canal upon the plan adopted by the State in 1836."*

In 1871, shortly after the great fire in Chicago (see Session Laws, 1871-2, p. 170), the General Assembly, under provisions of Section 5 of the Act of 1865, re-funded this money to the City of Chicago and discharged this lien.

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So it will be seen that the *primary* object for deepening the summit division was obtaining a supply of water *for the canal*, directly from Lake Michigan. To complete the canal ON THE ORIGINAL DEEP CUT PLAN, adopted in 1836, the *secondary* object was to furnish drainage to Chicago. To accomplish the *primary* object the City of Chicago was authorized to *complete the canal on the original deep cut plan*, and was given a *lien* on the canal and its resources for its repayment. The drainage of Chicago was a mere *incident*, a *secondary* consideration.

6241 In this connection and for the purpose of showing more conclusively what was intended by the Act of 1865, authorizing the deep cut on the summit level, it may be of interest to examine the Act of 1836, providing for the construction of the Illinois and Michigan Canal. (Vide Sess. Laws, 1836, p. 145.)

We quote from Sec. 16 of that act as follows:

"The said canal shall not be less than forty-five feet wide at the surface, thirty feet at the base and of sufficient depth to insure a navigation of at least four feet, to be suitable for ordinary canal boat navigation, TO BE SUPPLIED WITH WATER FROM LAKE MICHIGAN and such other sources as the Canal Commissioners may think proper, &c."

To be supplied with water from Lake Michigan for what purpose? For *navigation* simply? No, for ALL purposes; and one of the purposes *always* contemplated in making such improvements is the supplying of water power when practicable, and thereby aid, from the revenue thus derived, in maintaining, at the least possible expense to the public, these desirable enterprises.

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## V.

We desire to consider briefly the opinion of Mr. Justice Pillsbury, of the Appellate Court, as we presume

that opinion will, to some extent, be the basis of the argument that may be made in this court on behalf of appellee.

6242 Justice Pillsbury says (page 11 of abstract) that: "In construing contracts courts will examine their provisions in the light of the circumstances surrounding the parties, and the subject matter when made."

This is undoubtedly true, and is supported by the authorities cited by us on page 49 of our former brief.

To use the language adopted by Mr. Justice Caton in *Hodden v. Shentz*, 15 Ill., at page 582:

"The law must give a common sense construction to grants, and consider the state of things, and the consideration in view of the parties at the time the grant is made which move them to its execution and acceptance."

It becomes, then, for the proper application of this rule, necessary to inquire what the considerations are that were in view of the parties at the time the Havens' release was executed. It is a part of the conceded facts in this case that the Illinois and Michigan Canal was completed and opened for navigation in the spring of the year 1848. (See page 3 of abstract.) So that prior to that time there had been no diversion of the waters of the Desplaines River by the canal authorities. That diversion did not commence until the 20th day of April, 1848.

*Canal Trustees v. Haven*, 5th Gilm., p. 554.

6243 So that of course up that time there can be no claim or pretense that any water was allowed to *spill* from the summit

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level into the Desplaines River at Lockport. The cases of *Haven v. The Canal Trustees*, decided in the 5th of Gilman, was brought to the October Term of the Circuit Court of Will County for the year 1848, and was tried upon an agreed state of facts fully appearing in the opinion, from which, among other things, it appeared (*Canal Trustees v. Haven*, *supra*, p. 554) that

"on the 20th day of April, 1848, the defendants (Canal Trustees) diverted, or caused to be diverted, into the canal for the use of said canal, from the natural channel of the river, the whole or the principal part of the waters of said river by turning the same from the basin in said river by means of a dam on Section 9, being a

canal section, and about half a mile above the dam of said plaintiffs, so that the plaintiffs are wholly deprived of the use of the water at their said mills, and have not since been able to run their machinery. From the time of putting this portion of the canal under contract in 1838, and up to the year 1843, there had been no change in the original plan of *supplying the canal with water from Lake Michigan by the deep cut as originally contemplated*, and all contracts let previous to 1843, and all the arrangements of said canal, were made notoriously upon the plan aforesaid, *and with a view to supply the canal from Lake Michigan.*"

6244 In that case the Supreme Court decided that Section 16 was not included in the lands reserved from sale and granted to the State by the Act of 1822; so that the provision of the Legislature reserving a right of way for the canal, did not apply to Section 16, and on the state of facts presented in that case this court held that the Havens were riparian proprietors upon one side of the stream, and as such were entitled to the use of one-half of the natural flow of the stream. (p. 558.) This same case was again taken to the

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Supreme Court of this State upon the assessment of damages, and is reported in the 11th Ill., 554, and the judgment for damages reversed for the reason that they were excessive and that the amount which the Havens were entitled to recover, as the case then stood, was merely *nominal*. The Havens' contract, or lease, which is set forth in this record, was a settlement of this suit, and the preamble to the contract shows that it was intended as a settlement of the matters in controversy in *that* suit and for damages to the Havens occasioned by diverting the waters of said river from their mill and applying it to the use of the Illinois and Michigan Canal above said mill. When we take into consideration the agreed state of facts in the case reported in the 5th Gilman and the reference that is there made to the abandonment of the project for supplying the canal with water from Lake Michigan, and the further consideration that the Havens were then complaining that the

6245 canal was not thus supplied with water, but that on the contrary the trustees were using the natural water of the Desplaines River for that purpose, and the further

consideration that this suit was brought immediately after the opening of the canal, it is evident that the subject matter of that contract was the *natural water* of the Desplaines River, and *not* water that was then or that might any time thereafter *be added thereto from Lake Michigan*. Justice Pillsbury says in his opinion (p. 11 of abstract):

"We think it fairly deducible from the admitted facts, if not stated in so many words, that the hydraulic basin referred to as being at Norton's mills was a part of the original construction of the canal and that before the deepening of the summit level the surplus or waste water from that level was turned into the Desplaines River in the same manner it has been since,

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although in much less quantities."

There is no warrant for this deduction. There is nothing in the admitted facts that directly or indirectly concedes that a drop of water passed from the canal at Lockport into the Desplaines River until the canal and river formed a junction and were united in one stream. There was no *waste water* at Lockport. There could *not* have been from the fact that the summit level was supplied only in part by feeders, and the canal authorities were compelled to and did erect extensive pumping works for the purpose of assisting in supplying that level with water from the Chicago River at Bridgeport. There is no evidence, therefore, nor any fair inference, that the volume of the water in the river was at the time of the execution of this contract, or the commencement of the suit which this contract settled, increased by the water running in the canal to the slightest extent, except at the point where the canal and river were one; and there could be no inference further from the *true* facts in the case than that drawn by Justice Pillsbury when he says:

"With these facts within the knowledge of the parties and, as we must conclude, taken into consideration by them in adjusting the matters in dispute, it would seem that the trustees treated the right to the exclusive use of the water of the river, increased by their own work, so far as it could be necessary to appropriate it for the purposes of navigation, as a sufficient consideration for the relinquishment upon their part of any claim

to use or divert any portion of the water in the stream, from whatever source derived, not required for such purpose."

The *agreed* state of facts, as appearing in 5th Gilman, upon which the Haven suit was brought (and the Haven contract itself), shows as conclusively and clearly as anything can show that at the time of the execution of the Haven release all idea of making the deep cut *and supplying the canal with water from Lake Michigan had*  
6247 *been abandoned*, and the canal authorities were compelled to look elsewhere for their supply of water; and even if a slight quantity of water did escape from the canal into the river at Lockport at this time, the quantity was inconsiderable, and was not taken into account either one way or the other in the execution and acceptance of this release. In fact, it is evident that the Havens never imagined for a moment that they were entitled to any water except that which flowed naturally in the Desplaines River, and the Canal Trustees certainly never imagined for a moment that they were releasing or abandoning their claim to water that might thereafter be added by them from Lake Michigan. So that from the condition of the thing which was the subject matter of this contract and the circumstances surrounding the parties at the time, it is evident that the *only thing* concerning which these parties contracted was the *natural water* of the Desplaines River; and while we doubt not this release can be successfully relied upon as a bar to the claim now made, it certainly would be a strange construction of the release to say that it applied to other and different water than the *natural water* of the Desplaines River or that it applied to waters which, *in the contemplation of the parties at that time, never could become a subject of controversy.*  
6248 Again, the language of the release itself confirms us in the position we have taken. The release was executed to settle the suit brought for alleged damages "occasioned by diverting the water of said river," and in consideration of the money received the Havens "released and discharged the trustees from all action, rights of action, and all claims arising out of

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any damages heretofore, now or hereafter to be sustained by them *by reason of the use of the waters of the*

6249 *Desplaines River* for the purpose of supplying said canal in the same manner the same is now supplied at the feeder at Joliet. That is, they released damages on account of the diversion of the *water of the Desplaines River*, but in no manner can it be inferred that they set up any right or claim of right to the *waters of Lake Michigan*. And again, they grant the right to use and appropriate the water of the said *Desplaines River* at the feeders at Joliet below Guard Lock No. 1, for supplying the said canal for the purposes of navigation in the same manner the water in said river in connection with other feeders is now used for supplying said canal. And it is a part of the history of the canal, well known to all citizens at all familiar with its management, that from the opening of the canal in 1848 until the present time it has been one of objects of the canal authorities to supply water power at all points and under all circumstances where it was practicable for them to do so; and every act of the Legislature providing for the government of the canal, from the year 1839 to the present time, has made it the duty of the Canal Commissioners or trustees to derive all possible revenue from this source. Again, by applying to this release the well established doctrine that *all grants are to be construed most strongly against the grantor*, a doctrine so thoroughly settled as to be elementary, and we find that under the Havens' release the Canal Commissioners would be entitled to use *all the natural waters of the Desplaines River*, so far at least as those claiming under the Havens are concerned, for the purposes of navigation in the canal. This right continues for all time to come; and if you limit the grant to the use of such waters

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to the purposes of navigation alone, still applying the above rule, it could *only apply to the natural waters of the river*. Nothing else being in contemplation of the party at the time, leaving, therefore, the Canal Commissioners at full liberty to withdraw from the *Desplaines River* for the purpose of supplying water power privileges all the water which they had added thereto from *Lake Michigan* or other sources, provided always that the natural waters of the river afforded them a sufficient supply for the purposes of navigation, as it is, by the improvement of the state, appellee has been greatly



benefited and his water power largely increased. In what manner, therefore, can it be said that he has sustained damage? It seems to us clear that the effect given by Justice Pillsbury is unwarranted by the facts, and is in direct conflict with the rule that he himself lays down.

Again on page 14 of the abstract, Justice Pillsbury says:

"From the admitted facts, and from the circumstances surrounding the making of the improvement, or deep cut so-called, the conclusion is rendered certain that the said improvement was *not* made for the purpose of supplying the canal below Guard Lock No. 1 with water for canal purposes, but for the purpose *alone* of improving the drainage facilities of the City of Chicago by making the canal an outlet for its sewers by way of the Des-plaines River. All the facts and circumstances negative the idea that it was a part of the plan of the city in making such deep cut, or of the State in allowing the city to do so, to create a water power on the Channahon level, *or to furnish water for canal purposes.*"

It is impossible to believe that the learned judge who wrote this opinion had had his attention called to the act (38)

of 1836 providing for the construction of the canal, for if he had he would have seen that it was originally contemplated that so far as possible the canal should be supplied from one end to the other with water from Lake Michigan. The original plan of the canal contemplated the use of that water and relied upon Lake Michigan as the principal source of supply. It is also very evident that the learned judge failed to read the act of 1865, under which the deep cut was constructed, for the title of that act would have disclosed to him his error. It is also very evident that the learned judge supposed that the counsel for the appellee had quoted in their brief in this court the whole of the preamble to the act of 1865, and that he accepted the conclusions to which counsel for appellee had arrived as to the object of this deep cut, without a careful examination of the act itself; for, if the act of 1836 and the title to the act of 1865, *the preamble thereto*, and the act itself, are considered together (and it is necessary to thus consider them in

order to arrive at the legislative intent), it is as clear as the noonday sun in an unclouded sky that the object of the Legislature in causing this work to be done was to supply the canal with water from Lake Michigan, and to supply it for the use of the canal for all legitimate purposes, such as navigation of the canal itself, and the furnishing when practicable of water power along the route of the canal. The State did this work, and not the City of Chicago. It is true that the City of Chicago acted as the agent of the State in so doing. The City of  
6252 Chicago had an object to accomplish in which the State had no interest; but being an object of public importance, the State facilitated its accomplishment by allowing the city to advance the necessary funds to complete what the State had already planned,

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giving the city a lien, which lien was subsequently discharged by the State. The State never for one moment surrendered the control of the canal. The State never had in allowing this work to be done any other object in view than the deepening of the canal itself, and the act under which the work was done provided that the City of Chicago should be reimbursed, either from the revenues of the canal or from the treasury of the State. And if the learned judge was in possession of all these facts at the time of penning the quotation last above made, the conclusion arrived at is unaccountable, and must be a surprise to every one conversant with the facts, as well as to himself on further reflection.

## VI.

We desire to suggest in closing that the Appellate Court had no jurisdiction to hear or determine this case.

Sec. 88 of the Practice Act, Sess. Laws 1879, p. 222, provides that "All cases relating to revenue, or in which the State is interested *as a party or otherwise*, shall be taken directly to the Supreme Court."

6253 In the case at bar the State is *directly* interested, not as a party, it is true, but in the result. If this judgment is collected the State would be both legally and morally bound to refund the money to the appellant. And then again, if the judgment of the Appellate Court

is affirmed, all revenue to the State from this source will be lost.

Respectfully submitted,

G. D. A. PARKS,

E. F. BULL,

*For Appellant.*

5260 Counsel for defendant read in evidence the report of the United States Chief Engineer, 1901, Part 5, statements in regard to the Snake river, from pages 3529 to 3542, as follows:

“DESCRIPTION :—The Snake river is a long and very crooked mountain stream flowing from upward of 900 miles down the western slope of the Rocky Mountains. It is extremely irregular in its direction of flow, width, depth, and slope, as well as in its banks and bed. Portions of it are inclosed in steep, rocky canyons where the great slope causes extreme velocities, portions of it include waterfalls and cascades of great beauty, but only in its lower portions are reaches found where navigation is practicable. It rises in the mountains in the southern part of Yellowstone Park, flows southwest through the southeastern part of Idaho until within about 60 miles of the Great Salt Lake of Utah, and then flows westward through southern Idaho. It then turns north and forms for 200 miles the boundary between the States of Idaho and Oregon. At Lewiston, Idaho, where it receives the waters of the Clearwater River, it again flows westward and finally empties into the Columbia River in the State of Washington near the town of Ainsworth. It is subject each summer to very high rises, varying from 18 to 26 feet, due to melting of snow in the mountains, and remains in a state of flood for several months, usually commencing early in May and lasting until September. There is also usually an autumn rise in November varying from 4 to 10 feet, due to rains in the areas drained. The low water discharge of the Snake at its mouth in the Columbia River is reported to be 26,000 cubic feet per second. (See Annual Report of the Chief of Engineers for 1889, p. 2583.)

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The basin drained by the Snake River and its branches comprises the greater part of southern Idaho, large parts of eastern Oregon and southern Washington, and parts of Utah, Wyoming and Nevada. This area is esti-

mated to be 104,000 square miles. (See House Doc. No. 411, Fifty-fifth Congress, Second Session.)

Geologists state that the greater part of all this area has in former geological periods been subject to successive overflows of volcanic lava that now form the basaltic cliffs and mountains found in general over all this region. The river banks are, therefore, rocky and not easily washed, so that the Snake is not what may be properly termed a sediment-bearing stream. Considerable sand and gravel are carried, however, due mainly to the disintegration and wearing away of the rock and boulders forming its banks and bottom. The bottom also is mainly rock and boulders except where the sand and gravel have collected, due to natural causes, thus forming bars and shoals. In its upper portions it is said to be a typical mountain stream, having a rocky bed and swift currents with many picturesque falls and cascades. Above Huntington, Oreg., it does not appear that any special attempt at navigation has ever been made, probably because impracticable. Below Huntington, which is the western terminus of the Oregon Short Line Railroad, and the eastern terminus of the rail lines of the Oregon Railroad and Navigation Company, there is a reach of about 50 miles where an effort was once made at navigation many years ago, in the endeavor to afford water transportation from the Seven Devils mining regions to Huntington.

The Government spent a considerable sum of money from 1891 to 1896 in improving Snake river in the vicinity of Huntington. This was of no avail, however, as the only boat ever built for this section of the river, the Norma, gave up trying to run, after one trip, on account of the lack of paying business and the difficulties of navigation. Lower down from near Ballards Landing, just below Pine Creek, and as far down as the mouth of the Salmon river, the Snake flows in a deep, narrow canyon of basaltic rock for about 75 miles, where the slope of the river surface, sharp bends, and high irregular banks cause high velocities and cross currents and offer a serious obstruction to navigation that will always be formidable and dangerous, if not wholly unnavigable.

From the mouth of the Salmon river down to the mouth of the Grande Ronde river the difficulties of navigation are somewhat less serious, but still probably render the

river impossible for practicable navigation. The mouth of the Grande Ronde river may be taken as the present head of practicable high water navigation in the Snake. The lower 139 miles, however, from the mouth at Ainsworth, Wash., up as far as Lewiston, is the only part that has been successfully navigated at lower stages.

In former days, before the construction of the railroads, this lower section of the river, in connection with the Columbia river, formed the only quick and safe means of communication with Portland, Oreg., and the Pacific coast, where were located the commercial centers. Light-draft river boats plied from Portland as early as 1858 up the Willamette and Columbia Rivers 45 miles to the obstruction at 'The Cascades,' where a portage railway 6 miles long, at the Washington shore, passed the freight and passengers around these obstructions. For about 45 miles more steamers were operated in what was then called the middle Columbia river, or up to the town of The Dalles, Oreg., and there a second portage road, 13 miles long, on the Oregon shore, enabled freight and passengers to pass the obstruction between The Dalles and Celilo, Oreg., and be transferred to steamers on the 'upper river,' above Celilo. These latter steamers at most favorable stages, and usually for more than half of each year, could ascend  
5264 from Celilo up the Columbia to the mouth of the Snake, and up the Snake to Lewiston, which latter place thus became at an early date a center of distribution for a large outlying fertile region. The opening of the locks at 'The Cascades' in 1896, by the Government enabled steamboats to pass around one of the worst obstructions in the Columbia river, leaving the obstructions in the 12 miles between The Dalles and Celilo the only impassable ones to be overcome artificially in reaching Lewiston by water from Portland.

The completion of the Portland-Spokane line of the Oregon Railroad and Navigation Company's Railroad, in 1887, along and adjacent to the Columbia and Snake rivers as far as Riparia, Wash., robbed those two waterways of much of their old-time importance, so that all river navigation and portages on the Columbia above The Dalles and on the Snake were practically abandoned in 1888, except on the 73 miles of the Snake between Riparia, Wash., and Lewiston, Idaho. Between these

two points regular navigation has been maintained by the steamers of the Oregon Railroad and Navigation Company up to the present time, and occasional trips are also made by boats belonging to the Northern Pacific Railway Company and others. Occasional trips on the upper Snake have been made as far as the Grande Ronde river, about 25 miles above Lewiston, when the stage of water was favorable, but these trips are now so few and unimportant that the condition already existing, especially at boating stages, is believed to be sufficient for all the present needs of commerce. The proposed improvement by the Government of the Columbia river between The Dalles and Celilo will, if undertaken and finished, likely revive some of the old-time importance of the Snake river, especially from Lewiston down to its mouth, providing, as it would, an all-water transportation route during at least a portion of each year from Lewiston to Portland.

A survey of the lower 66 miles of the Snake river from Riparia down to the mouth, made in 1899 under direction of Capt. Harry Taylor, Corps of Engineers (report of survey printed in House Doc. No. 411, Fifty-fifth Congress, second session), renders a further survey of this portion unnecessary at this time, so that the portion from Riparia to Lewiston being the only portion now regularly used by vessels, the subject of this survey and report, is the only remaining part believed to be worthy of consideration at the present time in connection with the improvement of the river for navigation.

In the portion from Lewiston to Riparia (73.5 miles), recently surveyed, the average width is approximately, 750 feet, the discharge 22,000 feet per second, the total fall 196.6 feet, and the slope an average of 2.67 feet per mile.

5266 The low-water depth varies from  $2\frac{1}{2}$  feet to 25 feet, with an average channel depth of about 8 feet, and the velocity from 1.3 to 8.8 miles per hour. The banks are about 1,500 feet high and usually slope to the water's edge. In a few places, however, there are found narrow and fertile 'bottoms,' limited in area, usually lying at the mouths of small creeks. These 'bottoms' are the only cultivated lands immediately adjacent to the river, but these when irrigated are very fertile and yield luxuri-



antly a fine quality of fruit, berries, etc., considerable quantities of which are shipped out annually.

The river banks slope back to a height of many hundreds of feet, and the bunch grass found thereon offers a sparse but fairly good grazing for sheep and cattle. On high plateaus, some miles back from the river, are the richly productive wheat fields of eastern Washington and Oregon. Much of the wheat, now amounting to many millions of bushels annually, raised in the Camas, and Clearwater basins, Palouse and Big Bend countries, and the Wallawalla and Wallowa regions now passes down the Snake and Columbia River Valleys by rail. For a further description of the Snake river, including description of the rapids and bars and the work done in past years, attention is respectfully invited to Annual Reports of Chief of Engineers for 1877, page 1037; for 1889, page 2583, and for 1891, page 3218.

5267      **PREVIOUS IMPROVEMENT.**—The Upper Columbia and Snake rivers having formed one of the most important highways of travel in the region in early days before the railroads were completed, Congress, as early as 1872 made appropriations for the improvement of the Columbia, and in 1876 the Snake was added to the plan of improvement. From that time up to the present a total of \$288,500 has been appropriated for both rivers, of which, as near as can be learned from the records, \$117,850.57 have been applied to the Snake river from Lewiston down to its mouth, mainly below Riparia. The original project was to secure a depth of  $4\frac{1}{2}$  feet at low water from the mouth up to Lewiston. The greater part of this improvement was made below Riparia, as the dangers and difficulties met with by steamboats were greatest there. The method of improvement consisted mainly in blasting out obstructing boulders, removing dangerous ledges, scraping sand and gravel bars, and the construction of dikes to concentrate the river flow in selected channels. This work on the lower Snake below Riparia was stopped in 1888, as the steamboats had abandoned that section upon completion of the railways paralleling it, and the expenditures since then being small have all been devoted to improving the portion in actual use between Riparia and Lewiston.

5268      In 1892 \$20,000 and in 1894 \$25,000 were, as before referred to, appropriated for the improvement of the



SNAKE and Huntington bridge down to the Seven Devils mining district. Considerable work was done in freeing the river from obstructions in this locality. Considerable plant was collected, including drill scows, tools, etc., and the work of removing ledge rock and boulders was carried on for several seasons. Only one steamer, the *Norma*, was ever built for navigating this section of river, and she made but one trip, and then the owners abandoned the idea of running. In 1896 all the Government plant in this portion of the river was sold and the river improvement abandoned.

Before the improvement of the Lower Snake was commenced there were many shoal places where there was not over 2 feet depth at low water. At many rapids the channel besides being shoal, was rocky and thickly studded with outstanding boulders, and was very crooked and intricate. The current was very swift at places, and the early attempts at navigation were accordingly attended with frequent delays, much risk, and occasional loss. The effect of the improvement has been to remove ledge rocks from many places below Riparia, partially straightening the channel, and freeing the river of many obstructing points. Many boulders have been blasted, and sand and gravel bars scraped, both above and below Riparia. At several places considerable benefit has been obtained by the construction of dikes, closing undesirable channels and directing the river flow into selected places to occasion scour and increase the depths.

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Above Riparia the present condition meets fairly well the present demands of navigation at all stages except at and near extreme low water. Extreme low water is seldom reached and only occasionally are boats prevented from using the river for this reason, and then for only short periods. Much delay is experienced near low-water stages, however, by having to 'line' the boats over bars and by having to run with only partial loads.

PREVIOUS EXAMINATIONS AND SURVEYS.—An examination of the Upper Columbia and Snake rivers was made in 1866 by Lieut. (now Lieut. Col.) W. H. Hener, Corps of Engineers, and an estimate of cost of improvement made (see Annual Report, Chief of Engineers, 1866, Part IV, p. 330), amounting to \$166,686, with \$6,000 annually for dredging. In 1877 a further examination, with estimate of cost of improvement, amounting to \$132,000,

was made by Maj. (now Brig. Gen.) John M. Wilson, Corps of Engineers. No continuous survey of the Columbia and Snake rivers has ever been made up to the present day. The plans of improvement proposed in these prospects were for the benefit of the special places found most troublesome by steamboats, and only special, limited surveys of the localities to be improved were made.

- 5270 In 1897 a survey from Riparia to the mouth was made under direction of Capt. Harry Taylor, Corps of Engineers, and a project and estimate of cost submitted under date of January 27, 1898 (House Doc. No. 411, Fifty-fifth Congress, second session). The project of improvement as stated in this report was for securing at low water at least navigable depth of 5 feet everywhere from Riparia down to the mouth, a distance of 66 miles. The cost was estimated at \$165,000, with \$3,000 every two years for maintenance.

PRESENT SURVEY.—The present survey was commenced July 28, 1900, and the field work was completed September 24, 1900. The party, numbering 15, was under charge of Mr. Frank Gilham and was composed of a transit party and a level party, with the necessary boatmen, cook, and laborers. The party, using four bateaux, commenced at Lewiston and drifted downstream from time to time with the current when it was necessary to change camp sites. A line of levels, checked by a duplicate set of readings, was carried through the entire distance, the zero being the level of mean low water at the sea, assuming as correct the corresponding elevation of low water at Lewiston (708.6) as observed by the Oregon Railroad and Navigation Company.

- 5271 Low-water level was obtained from the zero of the gauge at Lewiston on the Oregon Railroad and Navigation Company's waterhouse and from that of the gauge on the central pier of the drawspan of the Riparia Railway bridge. These gauges were read daily at noon during the survey, and were found to indicate fairly well the corresponding stages of water at the two places. These gauges were put in place by the railway companies and have been read for many years by them. The zeros give the best information available of the level of extreme low water.



Present condition and improvement proposed. The description of the shoals, rapids, and other obstructed places between Riparia and Lewiston, where trouble in navigation is experienced at the present time, is as follows:

LIST OF RAPIDS, SHOALS, AND PROMINENT POINTS IN SNAKE RIVER FROM LEWISTON, IDAHO, TO RIPARIA,  
WASH. (Continued.)

Locality	Distance from Lewiston Miles	Elevation of low-water surface Feet.	Fall of water Feet.	Rate of fall per mile Feet.	Length of rapid Miles.	Depth of low water Feet.	Velocity of current per hour Miles.	
Rifle No. 2.....	13.03	655	.3	1.50	.20	4.5		{Gravel 6 inches in diameter and smaller.
Tranway Rapid:								
Head .....	16.06	654.1	}	8	.10	13		Bowlders and gravel.
Foot .....	16.16	653.3						
Bucket Tranway .....	17.36							
Rapid No. 8:								
Head .....	19.73	650.2	}	4.45	1.17	4	5.20	{Gravel 6 inches in diameter and smaller.
Foot .....	20.90	645						
Rapid No. 9:								
Head .....	23.73	639.2	}	14.12	.17	5	7	{Gravel 6 inches in diameter and smaller.
Foot .....	23.90	636.8						
Granite Point Rapid:								
Head .....	25.13	635	}	11.95	.41	5	5.35	{Bowlders 24 inches in diameter and larger.
Foot .....	25.54	630.1						
Granite Point .....	26.51							
Tranway .....	28.							
Wawawa .....	29.30							
Oldels Bar:								
Head .....	31.56	627.2	}	12.40	.50	2	6.30	{Gravel 6 inches in diameter and smaller.
Foot .....	32.06	621						
Log Cabin Rapid:								
Head .....	32.81	620	}	7.33	.45	3	5.10	{Gravel 6 inches in diameter and smaller.
Foot .....	32.26	616.7						
Almota Dead March:								
Head .....	33.94	616.4	}	{5. 8.33}	.92	3.6	{5. 7}	{Gravel 6 inches in diameter and smaller.
Foot .....	34.86	611.4						
Almota .....	36.30							
Illa Bar .....	37.82	606.5	.6	2.	.30	4		

5273 Present condition and improvement proposed. The description of the shoals, rapids, and other obstructed places between Riparia and Lewiston, where trouble in navigation is experienced at the present time, is as follows:

LIST OF RAPIDS, SHOALS, AND PROMINENT POINTS IN SNAKE RIVER FROM LEWISTON, IDAHO, TO RIPARIA, WASH. (Continued.)

Locality	Distance from Lewiston Miles	Elevation of low-water surface Feet.	Fall of water Feet.	Rate of fall per mile Feet.	Length of rapid Miles.	Depth of low water Feet.	Velocity of current per hour Miles.	
Illa Rapid:								
Head .....	38.13	506.2	{ 7.4	12.53	.59	6	7.60	Solid rock, boulders and gravel.
Foot .....	38.72	538.8						
Illa .....	38.57							
Lower Illa Rapid:								
Head .....	40.21	532.8	{ 1.4	11.67	.12	5		
Foot .....	40.33	531.4						
Wades Rapid:								
Head .....	42.61	539.4	{ 3	9.10	.33	6	7.	{ Gravel 6 inches in diameter and smaller.
Foot first pitch.....	42.94	536.4	{ 1.5	5.77	.26	7		
Head second pitch.....	42.94	536.4						
Foot second pitch.....	43.20	534.9						
Rapid No. 16:								
Head .....	46.01	531.4	{ 2.3	8.52	.27	5	4.50	{ Boulders and gravel; principally gravel.
Foot .....	46.28	579.1						
Upper Penewawa Rapid:								
Head .....	47.93	577.6	{ 3.3	9.17	.36	5	7	{ Boulders and gravel, 6 to 24 inches diameter.
Foot .....	48.29	574.3						
Lower Penewawa Rapid:								
Head .....	48.72	572.8	{ 1.5	7.50	.20	6		{ Gravel 6 inches in diameter and smaller.
Foot .....	48.92	571.3						
Penewawa .....	49.56							
Willow Rapid:								
Head .....	50.74	568.9	{ 2.5	10.	.25	6.5	8	{ Boulders and gravel.
Foot first pitch.....	50.99	566.4	{ 2.8	6.83	.41	8.	7.40	
Head second pitch.....	50.99	566.4						
Foot second pitch.....	51.40	563.6						
Central Ferry .....	56.77							
Dead Man Rapid:								
Head .....	56.86	577.6	{ 4.4	11.28	.39	2.8	6.10	{ Gravel 6 inches in diameter and smaller.
Foot .....	57.25	553.2						

Present condition and improvement proposed. The description of the shoals, rapids, and other obstructed places between Riparia and Lewiston, where trouble in navigation is experienced at the present time, is as follows:

LIST OF RAPIDS, SHOALS, AND PROMINENT POINTS IN SNAKE RIVER FROM LEWISTON, IDAHO, TO RIPARIA, WASH. (Continued.)

Locality	Distance from Lewiston Miles	Elevation of low-water surface Feet.	Fall of water Feet.	Rate of fall per mile Feet.	Length of rapid Miles.	Depth of low water Feet.	Velocity of current per hour Miles.
<b>Diamond Crossing:</b>							
Head .....	58.32	552.2	5.7	4.95	1.15	3	5.40
Foot .....	59.47	546.5					
<b>New York Bar Rapid:</b>							
Head .....	59.66	545.5	3.8	8.64	.44	6.5	7
Foot .....	60.40	541.7					
<b>Upper Goose Island Rapid:</b>							
Head .....	63.76	539.5	4.3	9.15	.47	3.5	7
Foot .....	64.23	535.2					
<b>Goose Island Bar:</b>							
Head .....	64.60	535.2					
<b>Goose Island Rapid:</b>							
Head .....	64.67	535.2	3.5	29.17	.12	6.	8.80
Foot, first pitch.....	64.79	531.7					
Head, second pitch.....	64.79	531.7	1.8	7.50	.24	7.	
Foot, second pitch.....	65.03	529.9					
<b>Little Goose Island Rapid:</b>							
Head .....	67.75	528.3	3.6	10.28	.35	3.	5.30
Foot .....	68.10	524.7					
<b>Little Goose Island Bar:</b>							
Head .....	68.50	523.1	1.9	3.73	.51	3	5
Foot .....	69.01	521.2					
<b>Rapid No. 24:</b>							
Head .....	69.01	521.2	3	6.38	.47	6.5	6.50
Foot .....	69.48	518.2					
<b>Upper Riparia Rapid:</b>							
Head .....	71.03	516.9	5	10.35	.29	7	6.10
Foot .....	71.32	513.9					
<b>Riparia Bridge</b>							
Head .....	72.85	513.3					
<b>Riparia (end of survey).</b>							
Head .....	73.25	513.					

Length of river surveyed, 73.5 miles.

NOTE.—Elevations refer to mean low tide at Astoria, Oreg., as given by the Oregon Railroad and Navigation Company's levels. Water surface refers to extreme low water.

5274 DETAILED DESCRIPTION OF SHOAL RAPIDS AND PROMINENT  
POINTS IN SNAKE RIVER FROM LEWISTON, IDAHO, TO RIPARIA,  
WASH.

Beginning of the survey is 0.25 miles above Oregon Railroad and Navigation Company's warehouse at Lewiston, Idaho.

LEWISTON, a city of about 5,000 inhabitants, is situated at the confluence of the Snake and Clearwater rivers, on the right bank of the former and left bank of latter.

1. LEWISTON RAPIDS:—This rapids is opposite Lewiston. It has a length of 0.57 of a mile and a fall of 4.1 feet, or at the rate of 7.19 feet per mile. The river just above the rapid has a low-water width of about 900 feet, narrowing down, with an almost square-shouldered gravel bar on the right, to a width of 230 feet. The gravel bar has a height of about 5 feet above low water, and width of about 900 feet. On the left bank of the river is a gravel bluff about 40 feet high. This sudden narrowing of the river, together with a shoal place extending across the river just above the head of the rapids, causes a current of 7.93 miles per hour. The least depth of water is 7 feet. No improvement is deemed necessary at this place, as the only difficulty experienced now is caused by the strong current.

5275 The Clearwater river empties into the Snake from the northeast, 0.60 miles below Lewiston. It has a low-water width of about 350 feet and a depth of about 7 feet. It is the only stream of any importance emptying into the Snake river between Lewiston and Riparia.

2. RIFFLE No. 1 (1.71 miles below Lewiston).—It is 0.20 of a mile in length and has a fall of 15 feet, or at the rate of 7.5 feet per mile, and at least depth of water of 10 feet. No special impediment to navigation was found here and no improvement is necessary.

3. DEAD MARCH (3.2 miles below Lewiston).—It has a length of 0.76 of a mile and a fall of 7.3 feet, or at the rate of 9.3 feet per mile. The least depth of water found was 4 feet. The river, which above the rapid is about 900 feet wide, is here divided by an island, which throws the main body of water into a channel on the south side about 450 feet wide. This sudden narrowing produces a current of 6 miles per hour. The other channel to the



north of the island is about 150 feet wide, and 1.2 feet deep and is blocked by shoals and boulders and not available for navigation at low stages. No special difficulty is experienced here now, but to secure a 5-foot channel it will be necessary to dredge near the lower end.

5276 4. DRY GULCH SHOAL.—This shoal is just above Dry Gulch Rapid and 4.45 miles below Lewiston. The river at this point makes a turn to the left and a tongue-shaped point reaches out from the left bank terminating in a shoal which extends across the river. The deepest water found on this shoal was 2.5 feet. It is proposed to dredge a channel 5 feet deep and 120 feet wide through this shoal.

5. DRY GULCH RAPID (4.66 miles below Lewiston).—It has a length of 0.10 of a mile and a fall of 3.4 feet, giving a rate of fall of 34 feet per mile, and a current of 8.8 miles per hour. A depth of 8 feet was found at the shoalest place. The swift water is caused by insufficient cross section, the river narrowing from 800 feet to 230 feet between a low gravel bar on the right bank, about 500 feet wide and 2 feet deep above low water, and a low rocky bluff on the left. The only impediment to navigation is the strong current. No improvement is proposed.

ALPOWA (9.4 miles below Lewiston).—A small settlement on the left bank of the river at the mouth of Alpowa Creek. A current ferry is maintained at this point.

6. ALPOWA RAPID (9.42 miles below Lewiston).—It has a length of 0.19 of a mile and a fall of 1.1 feet giving a rate of fall of 5.79 feet per mile. Seven feet was the shoalest water found here. No special obstruction to navigation exists.

5277 7. STEPTOW RAPID (11.06 miles below Lewiston).—It has a length of 0.55 of a mile and a total fall of 5.3 feet, or a rate of fall of 9.64 feet per mile. The difficulty here is the strong current, 7.1 miles per hour, and the crooked, narrow channel. Five and five-tenths feet depth at low water was found at the shoalest point. The river at the head of the rapid has a width of about 750 feet between high banks, and is divided by a low island 500 feet wide and 1.5 feet above low water. This throws the main body of water into a channel on the right about 250 feet wide, the other channel on the left being only about 120 feet wide and 1 foot deep. This reduction of the sec-

tion, taken in connection with a shoal just above the rapid, has a damming effect, the channel acting as a spillway. The improvement proposed at this place includes the deepening and straightening of the channel by dredging.

8. **LITTLE PINE TREE SHOAL** (13.01 miles below Lewiston).—It is probably caused by the river attaining the extreme width of 1,000 between low-water shore lines with a very uniform cross section. The depth of water varies from 2 to 7 feet, and falls at the rate of 4.5 feet per mile with a current of about 4 miles per hour. Dredging is necessary at this place.

5278 9. **LITTLE PINE TREE RAPID** (13.12 miles below Lewiston).—This rapid has a length of 0.28 of a mile and a fall of 6.9 feet, or at the rate of fall of 24.64 feet per mile. The only special impediment to navigation is the strong current, which flows at the rate of 7.5 miles per hour. The least depth of water found here was 8 feet. The rapid is caused by a low gravel bar which extends out from the right bank about 400 feet. This has the effect of diminishing the width of the river from 900 feet just above the bar to 350 feet opposite it. No improvement is proposed at this place.

10. **RIFFLE No. 2** (15.03 miles below Lewiston).—No difficulty is now experienced in navigating the river at this point. The rate of fall per mile is but 1.5 feet, with a slow current; 4.5 feet was the least depth found. No improvement is thought necessary at the present time.

11. **TRAMWAY RAPID** (16.06 miles below Lewiston).—This place offers now no special difficulties to navigation. The rapid has a total fall of .8 feet, or at the rate of 8 feet per mile. It is but 0.1 of a mile in length. The least depth found was 13 feet.

**BUCKET TRAMWAY** (17.36 miles below Lewiston).—Consists of a system of buckets hung on a wire rope for bringing wheat down from the farming land, about 1,500 feet above the river, to the steamer landing on the south bank of the river.

5279 12. **RAPID No. 8** (19.73 miles below Lewiston).—It is 1.17 miles in length and has a total fall of 5.2 feet, or at the rate of 4.45 feet per mile, with a current of 5.2 miles per hour. It has never been considered a difficult place to navigate. Four feet was the least depth found. Several boulders should, however, be removed at this place.

13. **RAPID No. 9** (23.73 miles below Lewiston).—It has a length of 0.17 of a mile and a fall of 2.4 feet, or at the rate of 14.12 feet per mile. It has a current of 7 miles per hour. The only impediment offered to navigation is the strong current, there being 5 feet of water at the shoalest places.

14. **GRANITE PINE RAPID** (25.13 miles below Lewiston).—It is 0.41 of a mile in length and has a fall of 4.9 feet, or at the rate of 11.95 feet per mile. It has a current of 5.35 miles per hour. The only important obstruction to navigation at this point consists of two rocks about 1.5 feet below low water. These rocks aggregate about 50 cubic yards. The rapid is caused by a sunken ledge of rocks extending across the river which has caused a bar about 600 feet wide to form on the right bank. The effect of this is to reduce the distance between the water lines from 900 feet above the rapid to 400 feet at its narrowest place. There are many sunken rocks and boulders in this stretch, but a fair channel is open near the left bank. The soundings gave 5 feet of water at the shoalest place. The two boulders above mentioned should be removed.

5280 **GRANITE POINT** (26.51 miles below Lewiston).—A granite ledge cropping out about 150 feet below the level of the water at the north side extends across the river, showing on the opposite bank. The granite in this quarry is of an excellent quality. It has been worked for about twenty years. Among other structures built of this stone might be mentioned the piers for the bridge across Snake River at Ainsworth, and the new Custom House at Portland, Oreg. The water at this place has a depth of 45 feet, being the deepest water between Lewiston and Riparia.

**TRAMWAY** (28 miles from Lewiston).—A tramway on the left bank of the river which is operated by the gravity system, the loaded cars coming down pulling the empty cars up. It is for the purpose of bringing wheat down to the river from the farming lands on the high plateaus.

**WAWAWA** is a small settlement on the right bank of the river, 29.3 miles below Lewiston. A current ferry is operated at this point, it being one of the crossings of the Pomeroy-Colfax wagon road.

15. **OFIELDS BAR** (31.56 miles below Lewiston).—The

river at this place has a low-water width of 800 feet, and a high-water width of about 2,500 feet. It has a fall of 6.2 feet in 0.5 of a mile, or at the rate of 12.4 feet per mile, and has a current of 6.3 miles per hour. About 100 feet out from the right bank there is a long, narrow island exposed for a width of about 20 feet at low water, which parallels the shore for about 1,000 feet. This terminates at the lower end in a bar which extends diagonally across the river, connecting with a small island near the right shore about 1,200 feet below. The water on this bar has a low-water depth of 1.5 feet. Between the upper end of this narrow island and the left shore of the river the water has a depth of 4 feet, and a point about opposite the lower end of the island and about midway between it and the left shore the water has a depth of 5.5 feet extending up and down stream for about 400 feet. The method employed in navigating this part of the river at low water has been to keep near the right shore, passing through the chute-like channel between the narrow island and the right shore and following the right bank for about 400 feet above the head of the island (see map). This is necessary on account of shoal water extending above the head of the island. The current is very strong in this narrow passage, necessitating the use of a line on up-stream boats. This narrow channel has a depth of 2 feet at its shoalest place, but owing to its trough-like shape the action of the wheel prevents up-stream boats from getting full benefit of the water. It is proposed to improve this place by cutting through the bar below the island, thus allowing boats to pass into this deep water opposite its lower end. Between this point and the deep water above the shoalest water found was 4 feet.

5281 16. LOG CABIN RAPID (32.81 miles below Lewiston).—It has a length of a mile and a fall of 3.3 feet, or at the rate of 7.33 feet per mile, and has a current of 5.10 miles per hour. By following a tortuous channel a depth of 3 feet was found. Just above the shoal the river, which has a width of about 700 feet, is divided by a low island about 300 feet wide and 1,500 feet long. Near the right shore the water passing to the right of this island has a width of about 250 feet and a depth of about 1.5 feet. This island terminates at its lower end in a shoal which

extends across the river, giving a depth of 3 feet near the left bank. A dike, now in bad repair, has been built by the United States in previous years to prevent the water from passing behind this island and by throwing all the water into the main channel to increase its depth. The method of navigation employed with up-stream boats has been to skirt the left shore until about opposite the lower end of the island, then turn abruptly toward the deeper water about midstream. A crib filled with rock has been erected near the left bank at the point where the turn is made to prevent boats from drifting upon the rocky shore. As the channel is so near the shore, this has always been a very difficult place to navigate, especially during high winds. The proposed improvement contemplated repairing the dike mentioned and cutting a straight channel 5 feet deep through the shoal.

5283 17. **ALTOMA DEAD MARCH** (33.94 miles below Lewiston).—It has a length of 0.92 of a mile, with a total fall of 5 feet. It has two pitches, one of which falls at the rate of 5 feet to the mile with a current of about 5 miles per hour, the other at the rate of 8.33 feet per mile with a current of 7 miles per hour. This last pitch is about 0.1 of a mile in length. The soundings showed a 3.6-foot channel at low water. The river has a low-water width of about 600 feet and a high-water width of about 1,500 feet. No difficulty is generally experienced in navigating this portion of the river, and no improvement is proposed at present.

**ALMOTA** (36.30 miles below Lewiston).—A settlement on the right bank of Snake River and is the principal settlement between Lewiston and Riparia. The building of railroads on the table-lands back from the river on each side has robbed it of much of its importance, but large shipments of wheat are still made from this point. A current ferry is operated here, it being on the Pomeroy-Colfax wagon road.

18. **ILIA BAR** (37.62 miles below Lewiston).—The river at this point has a low-water width of about 1,000 feet and a high-water width of about 1,400 feet. Opposite the lower end of the shoal the river is divided by a large island, the main body of water flowing to the left and a stream about 250 feet wide and 1 foot deep flowing to the right. The shoal connects the upper end of the

island with the left shore. This is not considered a difficult place. A 4-foot channel was found. No improvement is proposed at present.

5284 19. ILIA RAPID (38.13 miles below Lewiston).—It has a length of 0.59 of a mile and a fall of 7.4 feet, or at the rate of 12.53 feet per mile, with a current of 7.6 miles per hour. The least depth of water found was 6 feet. At about the head of the rapid the river is divided by a large island which crowds the main body of water into a channel on the left about 330 feet wide. The channel, which keeps to the right of the island, is about 250 feet wide and 1 foot in depth. The only impediment to navigation at this point is the strong current. No improvement excepting the removal of one rocky boulder is considered necessary.

ILIA (38.57 miles below Lewiston).—A small settlement on the left bank of the river, and is a wheat-shipping point of considerable importance.

20. LOWER ILIA RAPID (40.21 miles below Lewiston).—It has a length of 0.12 miles and a fall of 1.4 feet, or at the rate of 11.67 feet per mile. There is no impediment to navigation at this place. The shoalest water found was 5 feet.

5285 21. WADES RAPIDS (42.61 miles below Lewiston).—It has a total length of 0.59 of a mile and a total fall of 4.5 feet. The upper half falls at the rate of 5.77 miles and has a current of 7 miles per hour. The lower half falls at the rate of 5.77 miles per hour. The river, which is about 900 feet wide just above the rapid, is divided by Atwood Island, which throws the main body of water into a channel on the right side about 300 feet wide. The channel on the left of the island is about 100 feet wide and 1.5 feet deep. The least water found on this rapid was 6 feet. The only impediment to navigation is the strong current. No improvement is proposed.

22. RAPID No. 16 (46.01 miles below Lewiston).—It has a length of 0.27 of a mile and a fall of 2.3 feet, or at the rate of 8.22 feet per mile, with a current of 4.50 miles per hour. The river has a width of about 600 feet. The least depth found was 5 feet. No obstruction to navigation was found here.

23. UPPER PENNEWAWA RAPID (47.93 miles below Lewiston).—It has a length of 0.36 of a mile and a fall of

3.3 feet, or at the rate of 9.17 miles per hour. It has a current of 7 miles per hour. The shoalest water found was 5 feet. The rapid is caused by an insufficient cross section, the river narrowing down to about 400 feet between low water lines. No improvement is now needed at this place.

24. LOWER PENEWAWA RAPID (48.72 miles below Lewiston).—It has a fall of 1.5 feet in a distance of 0.20 of a mile, or at the rate of 7.5 feet per mile. The river has a width of about 600 feet and a depth of 6 feet.
- 5286 No improvement is necessary except removing two rocks, aggregating about 40 cubic yards.

PENEWAWA (49.56 miles below Lewiston).—A small settlement on the right bank of the river. It has a store, post office and hotel. A current ferry is operated here.

25. WILLOW RAPID (50.74 miles below Lewiston).—It has a total length of 0.66 of a mile divided into 2 pitches. The first has a fall of 2.5 feet, or at the rate of 10 feet per mile, and a current of 8 miles per hour; the second has a fall of 2.8 feet, or at the rate of 6.83 feet per mile, and a current of 7.4 miles per hour. The least depth of water found was 6.5 feet. The river just above the rapid has a low-water width of about 800 feet. It is divided by an island which contracts the main channel to a width of about 300 feet. The main body of water flows to the right of the island. The channel to the left is about 30 feet wide and 1 foot deep. The only impediment to navigation at this place is the strong current, which, setting toward the head of the island on the left, sometimes necessitates the use of a line. No improvement is proposed.

CENTRAL FERRY (56.57 miles below Lewiston) is a current ferry at the crossing of wagon road.

26. DEAD MAN RAPID AND BAR (56.86 miles below Lewiston).—It has a length of 0.36 of a mile and a fall of 4.4 feet, or at the rate of 11.28 feet per mile. It has a current of 6.10 miles per hour. The soundings gave a depth of 2.8 feet at the shoalest place. The river at this point is divided by Dead Man Island, the main channel, about 600 feet wide, going to the right. The channel passing to the left is about 200 feet wide and 1.3 feet deep. Dredging to 5 feet depth will be necessary.
- 5287

27. DIAMOND CROSSING (58.32 miles below Lewiston).



—It is a long, diagonal bar extending from New York Bar on the left to the right bank. Three feet was the least depth found at this shoal. To secure a 5-foot channel it will be necessary to dredge.

28. NEW YORK BAR RAPID (59.96 miles below Lewiston).—It has a length of 0.44 of a mile, and a fall of 3.80 feet, or at the rate of 8.64 feet per mile. It has a current of 7 miles per hour. The least depth found here was 6.5 feet. The river above the rapid has a width of about 1,200 feet. It is divided by a low island about 800 feet wide, the main body of water flowing to the right through a channel about 400 feet wide. The channel to the left is about 50 feet wide. The rapid is the result of this narrowing of the waterway. The strong current is the only impediment to navigation. No improvement is proposed.

5288 29. UPPER GOOSE ISLAND RAPID (63.76 miles below Lewiston).—It has a length of 0.47 of a mile and a fall of 4.3 feet, or at the rate of 9.15 feet per mile, with a current of 7 miles per hour. Three and five-tenths feet was the least depth found. Just above the rapid the river has a width of 1,300 feet and is here divided by the upper island of the group known as Goose Island, which extends down the river for about 4 miles. These islands are three in number, the most elevated being about 16 feet above low water, the river at this point being 2,000 feet wide. The main channel keeps near the right bank and is about 400 feet in width. The channel on the left of this upper island is about 475 feet wide and has a depth of 5 feet. This is again divided. One branch, bearing to the right, passes between the upper island the second of the group. This channel has a width of about 200 feet and a depth of 1 foot. The channel has a width of about 200 feet and a depth of 1 foot. The channel which keeps to the left has a width of about 250 feet and a depth of 1.5 feet. It has a very strong current and is blocked with many bowlders. It is not considered necessary, however, to make any improvement at this place at this time.

30. GOOSE ISLAND BAR (64.60 miles below Lewiston).—This bar has formed in the pool between upper Goose Island Rapid and Goose Island Rapid proper and near the head of the latter. The water on the bar has a depth

of 2 feet. The river here has a width of about 1,800 feet and is divided by the lower island of the Goose Island group, the upper end of this island being about opposite the bar. A shallow channel flows between the second of the group and this lower island about 400 feet wide and 1 foot deep. Two dikes have been constructed across this channel for the purpose of contracting the flow of water over the bar. The first built was placed across the channel at a point about 300 feet back of the shoulders of the two islands. This dike is in bad repair. The last constructed is on a line between the shoulders of the island, but lacks about 500 feet of connecting them. The improvement proposed for this place is to complete the last-mentioned dike and cut a channel 60 feet wide and 5 feet deep through the bar.

31. GOOSE ISLAND RAPID (64.67 miles from Lewiston).—It has a total length of 0.38 of a mile and a total fall of 5.3 feet at its steepest place. It falls at the rate of 29.17 feet per mile, with a current of 8.8 miles per hour. The shoalest water found over this rapid was 6 feet. The river is here divided by the lower island of the Goose Island groups, the main body of water flowing through a channel on the right about 200 feet wide. The river at this point has a high-water width of about 1,800 feet, there being a low bar on the right about 1,100 feet wide. No improvement is contemplated at this rapid.

32. LITTLE GOOSE ISLAND RAPID (67.75 miles from Lewiston).—It has a length of 0.35 of a mile and a fall of 3.5 feet, or at the rate of 10.28 feet per mile, and a current of 5.3 miles per hour. The shoalest water found was 3 feet. The river at this point has a width of about 1,500 feet and is divided by Little Goose Island, the main body of water flowing to the right in a channel about 550 feet wide. The branch flowing to the left is about 100 feet wide and 1.5 feet deep. Near the right bank of the main channel there are many sunken rocks. The steamer channel lies near the right bank of the island. No improvement is considered necessary at this place at the present time.

33. LITTLE GOOSE ISLAND BAR (68.50 miles below Lewiston).—It is a continuation of Little Goose Island. It begins at the lower end of the island and crosses the river diagonally, connecting with the right bank of the river

about 1,500 feet below. The river at this place is about 1,200 feet wide. The water has a depth of 3 feet at its shoalest place. It is proposed to improve at this place by dredging a channel 60 feet wide and 5 feet deep through the bar.

34. RAPID No. 24 (69.01 miles below Lewiston).—This rapid has a length of 0.47 miles and a fall of 3 feet, or at the rate of 6.38 feet per mile, and a current of 6.5 miles per hour. The least depth found was 6.5 feet. The river at this point has a width of about 550 feet. It is flanked on the right by a low gravel bar about 800 feet wide. No impediment to navigation was found at this place.

5291 35. UPPER RIPARIA RAPID (71.03 miles from Lewiston).—It has a length of 0.29 of a mile and a fall of 3 feet, or at the rate of 10.35 feet per mile, and a current of 6.10 miles per hour. The least depth found was 7 feet. The river is here divided by McGuire's Island, the main body of water flowing to the right through a channel about 400 feet wide. The channel is about 200 feet wide and 1 foot deep. No improvement is necessary at the present time.

RIPARIAN BRIDGE (72.85 miles from Lewiston and 73.5 miles from initial point of survey).—This is the Snake River crossing of the Spokane Branch of the Oregon Railroad and Navigation Company's Railroad. It has a length of 1,008 feet and a drawspan at the south end of 350 feet. Its grade is 38.1 feet above low water and 13 feet above high water. This is the initial point of the survey made of Snake River in 1897 from Riparia to the Columbia River, total length 66.7 miles; Lewiston to this bridge, 72.85 miles; Lewiston to mouth of river, 139.55 miles.

RIPARIA (end of survey, 73.25 miles from Lewiston and 73.5 miles from initial point of survey).—A station on the Spokane Branch of the Oregon Railroad and Navigation Company's Railroad. At this place all freight to and from river points between Lewiston and Riparia is transferred to rail, it being the lower terminus of the steamboat line to Lewiston.

5292 The vessels now in Snake River, between Lewiston and Riparia, are all stern wheel, flat-bottomed boats, a list of which, with their dimensions is as follows:

	Draft.									
	Length.		Beam.		Depth.		Light.		Loaded	
	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
Spokane	100	4	38	6	6	3	2	0	3	8
Lewiston	165	0	34	4	5	3	1	0	2	6
Almota	157	0	36	0	5	0	1	8	3	6
Norma	160	0	32	6	5	6	1	11	3	4
	191	0	36	4	6	0		27	3	9

The difficulties encountered arise in all cases from insufficient depths, occasional obstructing bowlders, and swift currents. Near low water stages the steamers find it necessary at present to lay out ropes fastened to trees or to posts conveniently placed and haul themselves with steam windlasses over shoal places and through rapids too swift to be navigated otherwise. The boats being all flat-bottomed and the bars in this part of the river being all sand and gravel, this can be done without damage until the depth of water becomes insufficient, when navigation ceases. The dimensions of the above steamers are said to be those found best by experience for the conditions to be met in this river, and will not likely change much in the future unless the conditions are decidedly altered.

5293 The comparatively large cross section of the river, the large discharge (22,000 feet per second), and the relatively high average slope (2.67 feet per mile) render the effect of the proposed dredged channels unimportant in changing the area of cross section so as to injuriously alter the currents or levels above, especially as the depth of cut to obtain 5 feet at low water is in most cases slight and not over 3 feet at the worst places. The dikes proposed to not increase the currents above what can be easily ascertained by the present boats. The river bottom at all these places is composed of coarse sand and gravel and small cobblestones which, if not found practicable to remove by increasing the currents by contracting dikes, can probably be easily dredged with a grapple bucket operated by a hoisting engine from a small derrick scow, especially if the bottom should be first loosened with small charges of explosives. In for-

mer years a heavy scraper towed by a steamer gave fairly satisfactory results in scraping bars.

5294 A depth of 5 feet at low water has been selected in the project for the improvement of the river below Riparia (see House Doc. No. 411, Fifty-fifth Congress, second session), and any extensive improvement above Riparia to be effective should provide no less depth than this over all the above named shoals. The thorough improvement of this section would therefore probably require a deepening of the channel through all these shoal places, the construction of a number of deflecting dikes to secure and maintain the depths, and the removal of all the boulders and rocky points likely to interfere with vessels at low water.

The navigation of this section of river, however, is at present limited to one vessel each way daily, and it is not deemed advisable to include more points for improvement at the present time than necessary to relieve the most troublesome places. Low water periods are of short duration, and present conditions are satisfactory except at low stages. For these reasons the extent of improvement proposed in this report provides only for the following, the dredged channels being 5 feet deep at low water and in most cases 60 feet wide."

5370 Thereupon counsel for defendant read in evidence extracts from the report of the Chief of Engineers for 1876, part 2, as a supplement to the part theretofore read by counsel for complainant upon pages 204, 206, 207, 209 and 234 to 239.

5371 Page 204:

"The river" (says Marquette) "on which we embarked is called Meskousing," (Wisconsin). "It is very broad, with a sandy bottom, forming many shallows, which render navigation very difficult. It is full of vine-clad islets. On the banks appear fertile lands diversified with wood, prairie and hill. Here you find oaks, walnut, whitewood, and another kind of tree with branches armed with long thorns. We saw no small game or fish, but deer and moose in considerable numbers."

5371 Pages 206-7:

The limestone bluffs and highlands begin on the Wisconsin about 8 miles below the portage. Just above

Prairie du Sac appears to be the apex to the highland of the Wisconsin and the head of the great valley through which that river winds. The river is full of islands, formed by the sand-bars, which are constantly increasing in number. The general depth of the river is, at the ordinary height of the water, 4 to 5 feet, but the sand-bars often extend entirely across the river, and have not more than 8 or 10 inches of water; the sands, however, are quick, and oppose but little resistance.

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5372 Page 209:

The Wisconsin may be rendered navigable by the removal of the timber from its banks where it overhangs the channel, and occasionally contracting its waters by closing the heads of the sluices or shallow channels around the islands. \* \* \* Its general width is about a mile; these improvements, therefore, will permit the steamboats which navigate the Upper Mississippi to ascend this river to the Great Bend nearest to Lake Michigan.

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5372 Pages 234-9:

The Lower Fox forms the outlet of Lake Winnebago, a body of water 35 miles long, from 9 to 14 miles wide, with depths varying in the deepest parts from 12 to 25 feet. Over the 15½ miles of lake navigation, between the Upper and Lower Fox Rivers, there is a depth of over 20 feet. This lake is a great reservoir, and prevents any sudden changes in the volume of the outlet from freshets—the extreme fluctuations in the Lower Fox not exceeding 3 or 4 feet. The level of the lake does not reach more than 3½ feet above the ordinary level maintained by the dams at the outlets, but it is occasionally drawn down by the water-power mills nearly 2½ feet below this level. The total fall from Lake Winnebago to Green Bay is about 170 feet, and the distance 37½ miles. The minimum volume of the Lower Fox is given by Mr. Westbrook at 2,320 cubic feet per second.

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5373 The following table is made up from the figures of Major Suter's report, as modified by me in arrangement in the foregoing abstract:

TABLE IN REGARD TO THE LOWER FOX RIVER IN THE AUTUMN OF 1867.

Place	Inter- mediate Distance.	Distance from mouth of river.	Number of locks.	Elevation overcome.
	Miles.	Miles.		Feet.
Depere, dam	7	7	1	8
Little Kaukana, dam	6	13	1	8
Rapid Croche, dam	6	19	1	8
Grand Kaukana, dam	4½	23½	5	50
Little Chute, dam	2½	26	4	38
Cedars, dam	0¾	26¾	1	10
Appleton, lower dam	3	29¾	1	8½
Appleton, upper dam	0¾	30½	3	29½
Menasha, dam	5	35½	1	10
Lake Winnebago	2	37½	.	.
Total	37½		18	170

(Continued next page.)

5374 TABLE IN REGARD TO THE LOWER FOX RIVER IN THE AUTUMN OF 1867.  
(Concluded.)

Cost of making navigation from one dam to next above.			
Place.	Height above Green Bay.	For 4 feet draught, locks 160 x 35.	For 6 feet draught, locks 220 x 35.
	Feet.		
Depere, dam	8	\$45,000.00	\$83,300.00
Little Kaukana, dam	16	3,000.00	27,730.00
Rapid Croche, dam	24	4,000.00	41,000.00
Grand Kaukana, dam	74	22,800.00	111,670.00
Little Chute, dam	112	17,530.00	77,200.00
Cedars, dam	122	3,930.00	23,400.00
Appleton, lower dam	130½	.....	11,000.00
Appleton, upper dam	160	18,870.00	63,870.00
Menasha, dam	170	13,270.00	54,200.00
Lake Winnebago	170	.....	.....
Total		\$118,400.00	\$493,370.00



5375 Condition of the Upper Fox River and improvement in 1866.—The present traveled route between Oshkosh and Fort Winnebago is 104 miles, the air-line being 54 miles. As near as can be estimated, there have been 18,000 feet of cut-off by dredging making a saving of about three-fifths of the distance. The total fall is about 33-1/10 feet. In most places there is a fall of a foot in 2½ miles, but there are long reaches where the fall is scarcely perceptible. Several lakes occur on the course of the river, which are generally shallow and full of wild rice.

The mouth of the Fox River at Oshkosh is very deep; the channel has upward of 20 feet of water, which continues along the whole river-front of the town; thence to Lake Buttes des Morts, and through that lake there is over 12 feet of water; the river is broad and deep, with no perceptible current. About 10 miles from Oshkosh the Fox is joined by the Wolf River, a stream of nearly its own size. This river is navigable for about 50 miles; it penetrates into the lumber regions in the northern part of the State, and a great quantity of logs and sawed lumber is floated down the river to Oshkosh.

After passing the mouth of Wolf River 6 feet is the least depth until we reach Omro Bar, half a mile below the town of that name; thence to the town, 4½ feet of water. This portion of the river is quite crooked, 5376 but this is of no great importance to small vessels, on account of the depth of the water. Two miles below Omro a cut about a mile long, carrying the waters of the Fox straight to Lake Buttes des Morts, would save 7 or 8 miles of distance. From Omro to Delhi there is about 5 feet of water; never less, except in small spots. Above Delhi there is the same depth to Eureka Bar. From here to the town of Eureka 1½ miles, there is only from 4 to 4½ feet, with occasional deep spots. In front of the town there is 6 feet of water. At Eureka there is a permanent bridge, the only one between Berlin and Oshkosh. There are several floating bridges, however, where country roads cross the river. From Eureka to Sacramento there is an average depth of 6 feet. The river is quite narrow.

Above Sacramento there is an average depth of 5 feet

halfway to Berlin; then from 4 to  $4\frac{1}{2}$  feet as far as a floating bridge three-quarters of a mile below Berlin. Above this bridge, and also in front of the town of Berlin, there is about 5 feet of water. Between Sacramento and Berlin there is not much marsh along the river, and the banks are generally high. Above Berlin, the average depth is from 5 feet to 6 feet for 8 miles. At this point there is a short bar on which the water is only  $3\frac{1}{2}$  feet deep. The average depth above here is from 5 feet to 6 feet, until the mouth of the Puckeyan River is reached.

5377 Just above the mouth of this stream is a short bar with  $3\frac{1}{2}$  feet of water. At the lower end of Willow Bend is another short bar with  $3\frac{1}{2}$  feet of water. At the mouth of White River is a bad bar 300 yards long, and having only 3 feet of water on it. In the west side of the first bend above White River is a flat bar caused by a sudden widening of the stream. It is 200 yards long, and has  $3\frac{1}{2}$  feet of water on it. (The lowermost wing-dam is about 2 miles below State Centre.) There is a bar below this lower wing-dam with 3 feet of water. Above this wing-dam there is from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  feet of water; usually 4 feet and often more. The banks of the stream from Berlin to the lower wing-dam are generally low and marshy, but above this point they are quite high, and continue so to the mouth of the Mechan River. There is a second wing-dam at State Centre. At Saint Mary are the ruins of a bridge. From Saint Mary to Princeton the river is quite shoal. The average depth is 4 feet, but on the bars there is less than 3 feet. There are two more wing-dams at Princeton. There is also at this point a good, permanent bridge across the Fox.

5378 Between Princeton and the mouth of Mechan River there are three wing-dams. In this portion of the river the water is quite shoal, not more than 3 feet deep. From Omro to the mouth of Mechan River the fall is about 1 foot in  $2\frac{1}{2}$  miles, and there is quite a strong current. Above Mechan there is slack-water to Lake Puckaway. The river is very wide, with 6 feet or 8 feet depth of water or more. Within the Big Bend, above Princeton, the ground is quite high, about 30 feet above the level of the river. If a canal could be cut through here about 10 miles would be saved, as the neck is only a mile wide.

Lake Puckaway is a sheet of water  $8\frac{1}{4}$  miles long and

from 1 to 2 miles wide. The lower end of the lake is very shallow and full of reeds and wild rice. A channel, running northeast from Marquette, has been cut through for steamers. It is from 3 feet to  $3\frac{1}{2}$  feet deep. A channel, having 4 feet of water, leads along the eastern shore of the lake. The bottom of the lake is very soft, black mud, through which a channel of any depth can be easily dredged. For about a mile to the westward of Marquette the lake is filled with rushes. A channel exists, however, which has about  $4\frac{1}{2}$  feet of water. After getting out of the rushes, there is from 5 feet to 6 feet of water to the end of the lake.

5379 At the mouth of the Fox, that is, where it enters Lake Puckaway, there is a bar half a mile long, where there is only from 3 feet to  $3\frac{1}{2}$  feet of water; above this there is 5 feet or 6 feet for about 3 miles. Just below the large bend there is about  $4\frac{1}{2}$  feet; then for a mile from 6 feet to 7 feet. The rest of the way to Montello the river is shallow. Three and a half feet is the average depth, and 3 feet is the least. There are a good many sand-banks just below Montello which wash into the stream and cause bad bars. The current between the lake is quite rapid.

At Montello, a lock and dam are being constructed to raise the water above Lake Buffalo. As shown by the plan, it is designed to cut the canal through into a bayou, which has a depth of about 7 feet. The Montello River has also been turned into this bayou.

The dimensions of the lock, dam, and canal when finished will be as follows: Dam, 151 feet long; canal, 650 feet long and 90 feet wide; lock-lift, 3 feet; depth on lower miter-sill, between 8 feet and 9 feet; height of lock, 15 feet; length, 160 feet; width, 35 feet; composite lock, with head-walls of masonry.

5380 Above the mouth of Montello River there is from 4 to  $4\frac{1}{2}$  feet of water as far as the lower end of Lake Buffalo. Lake Buffalo is a large rice-field, about  $13\frac{1}{2}$  miles long and half a mile wide. The Fox crosses it in a very tortuous but deep channel. After entering the lake there is from 6 feet to 9 feet as far as Packwaukee, and even as deep as 15 feet. This is a pile-bridge across the lake at Packwaukee. From Packwaukee a good channel leads to the end of Buffalo Lake. The water runs from 7 feet to 9 feet in depth. Between Lake Buffalo and Lake

Menomin there is a channel of about the same depth, and also through Lake Menomin. This channel is exceedingly crooked. Lake Menomin is a large wild rice-field like Lake Buffalo. It is  $1\frac{1}{2}$  miles long by half a mile wide. After leaving this lake, and especially after passing Merritt's Landing, just above Moundville, a series of small, but bad, bars are met with. They are caused by the washing of a high sand-bluff on the river-bank. These bars have barely 3 feet of water on them. The worst of them could be avoided by a cut-off. In the last mile below Roslyn the channel is as a general rule quite deep—from 6 to 8 feet; but shoal spots occur, where only  $4\frac{1}{2}$  feet is to be found. The channel is exceedingly crooked and narrow. A great many cut-offs should be made in this portion of the river.

5381 From Roslyn to the first cut-off there is from  $5\frac{1}{2}$  to 7 feet of water. Just below this cut-off is a short bar with only 3 feet of water. In the cut itself there is about 4 feet. Above the cut is another bar with 3 feet depth. This first cut-off is only about 40 feet long; but it saves nearly a mile of distance. From the first to the second cut-off the depth is about  $4\frac{1}{2}$  feet. In the cut-off there is a bar with about 3 feet of water. The rest of the cut has a depth of about  $4\frac{1}{2}$  feet. From the second to the long cut-off there is from 6 to 9 feet of water. At the lower end of the long cut-off there is 5 feet of water; at the middle, 4 feet; at the upper end, 3 feet, with a short bar having from 2 feet 8 inches to 3 feet. From the end of the cut-off to Governor's Bend lock there is about 5 feet of water. Between Governor's Bend lock and Roslyn the stream is very crooked, and several long cut-offs should be made. The cut-off just below Governor's Bend is about a mile long, and saves about 3 miles. Governor's Bend lock, dam about 4 feet high and 69 feet long. Canal, 570 feet long and 57 feet wide. Lock, composite; lift 4 feet; depth on lower miter-sill, 5 feet 6 inches; height, 15 feet; length, 160 feet; width, 35 feet; new and in good order. From this lock to Winnebago lock there is slack-water. The channel leads almost entirely through cut-offs, and is quite free from sharp bends. The width of these cut-offs is about 60 feet. The depth will average  $4\frac{1}{2}$  feet to within a mile of Winnebago lock. In this last distance the channel is  
5382 full of sand-bars. The water gradually shoals from  $4\frac{1}{2}$

feet to  $2\frac{1}{2}$  feet. At the foot of Winnebago lock there is 8 feet of water.

At Winnebago lock the lift is 7 feet; depth on lower miter-sill, 6 feet 1 inch; height, 17 feet; length, 160 feet; width, 35 feet. Composite lock with masonry head-walls; all in good order.

5383 The canal which connects the Fox and Wisconsin Rivers is quite shoal. At the lower end it is 5 feet deep for about 200 feet; then 3 feet deep to within 500 feet of the first railroad-bridge; then  $2\frac{1}{2}$  feet deep to the second railroad-bridge; then 2 feet deep to the town of Portage. At the upper or Wisconsin end it is about 18 inches deep. The mill at the lower end draws the water down about 1 foot. At the upper end of the canal is a guard-lock, which is used as a lift-lock when the Wisconsin is high. It is in a very dilapidated condition, and should be rebuilt. It is  $2\frac{1}{2}$  miles (12,400 feet) in length, and 75 feet in width. It is cut through a flat, sandy plain which separates the waters of the Fox from those of the Wisconsin. The Fox River is about 5 feet lower than the Wisconsin in ordinary stage of water. During high water the Wisconsin overflows this neck of low ground at Portage, and also 5 or 6 miles above, and a large portion of its waters are thus diverted to Green Bay. The spring rise in the Fox is principally owing to this cause, for the Fox itself fluctuates very little. About 7 miles below Portage a stream called Big Slough comes into the Fox. During high water this connects with the Wisconsin and becomes a very considerable stream, bringing a large volume of water into the Fox. In fact, the greater part of the low country between the two rivers is overflowed by the Wisconsin at this time. It will be seen that the canal is not straight, but makes a considerable bend to the westward. The object of this was to place the mouth of the canal on the Wisconsin side, above an island. It was afterwards proposed to give it a different direction, but the idea has never been carried out. At present the main bulk of the Wisconsin runs through the inshore channel, and the whole of it can be diverted through there if desirable. It is also much easier to protect the mouth of the canal in the proposed position than in the one it occupies at present. But the change is not a matter of any great importance.

The canal at present is almost filled up with sand, but it is being dredged out.

5384 The only plan of improvement of the Upper Fox River which gives promise of permanency is to create slack-water navigation throughout the whole length of the stream by means of locks and dams. As a great deal of valuable property would be overflowed and ruined by putting in high dams and locks of great lift, it appears preferable to use low dams, say 3 feet high, and then lower the bed of the stream above and below the dam by dredging sufficiently to destroy the current. Further dredging will give the requisite depth for navigation, and the channel thus made will remain permanent.

Three locks appear necessary between the mouth of Meehan River and Omro. Above the former and below the latter point there is slack-water already, or will be when certain improvements in progress are finished; notably the Montello lock and dam.

The total fall between Meehan River and a point  $1\frac{1}{2}$  miles above Eureka is 12.87 feet, which it is proposed to distribute as follows: one lock at Princeton, 4 feet lift; one lock at Fiddler's Bend, 4 feet lift; and one lock  $1\frac{1}{2}$  miles above Eureka, 5 feet lift.

Ten feet of this total lift is included in the 12.87 feet, the remainder of that sum being allowed for backwater and flowage.

5385 Details from Winnebago lock to Governor's Bend lock; distance,  $5\frac{1}{2}$  miles; fall not accurately known, as the bed of the stream has been much lowered by dredging since the last survey was made. The lock has about 4 feet lift, so that the fall is probably between 4 and 5 feet. Slack-water exists above Governor's Bend dam.

Governor's Bend lock to Montello lock; distance 21 miles; fall, 5.95 feet, as nearly as can be computed. This is thought to be too much. The Montello dam is to raise the water 3 feet, and it is proposed to lower the bed below Governor's Bend lock 1 foot by dredging. This will, it is hoped, give slackwater back to Governor's Bend lock; but, in case it does not, the Montello dam can be raised 1 foot more. It will probably be necessary to lower the bed of Governor's Bend lock 2 feet to enable a vessel drawing 6 feet of water to get through it; but this cannot be stated positively until a new set of levels has been run to ascertain the exact amount. The

Montello dam can be raised, if necessary, without overflowing a great extent of country.

From Montello lock to head of Lake Puckaway: distance, 7 miles, fall, 4.93 feet. Bed of stream to be lowered 4 feet by dredging below the Montello lock, leaving .93 foot fall in 7 miles, or about .13 foot to the mile. From the head of Lake Puckaway to the mouth of Mechan River there is slackwater.

From mouth of Mechan River to Princeton lock: distance,  $5\frac{3}{4}$  miles; fall, 2.57 feet. Water to be raised 2 feet by a dam, and lowered below the dam 2 feet by dredging. Lock, 4 feet lift; flowage, .57 foot.

- 5386 Princeton lock to Fiddler's Bend lock: distance, 12 miles; fall from foot of Princeton lock, 2.92 feet. Water to be raised 2 feet by the dam, and lowered 2 feet below the dam by dredging. Lock, 4 feet lift; flowage, .92 foot.

Fiddler's Bend lock to Eureka lock: distance,  $15\frac{1}{4}$  miles; fall from foot of Fiddler's Bend lock, 3.38 feet. Water to be raised 2 feet by a dam, and lowered below the dam 3 feet by dredging. Lock, 5 feet lift; flowage, 1.38 feet.

From Eureka lock to Oshkosh: distance, 24 miles; fall, 5.80 feet. Water to be lowered 3 feet at upper end of level by dredging, as stated for Eureka lock. This will reduce the fall 2.80 feet in 24 miles, or a little less than 12 foot to the mile, which is practically slackwater.

The volume of the Upper Fox at low water is not stated by Major Suter, nor have I seen it stated for any point of its course. At the lock near Fort Winnebago it is a very small stream at low water, merely sufficing as a feeder to slackwater navigation. Its amount is of no practical importance in this view, for any needed supply can be drawn from the Wisconsin River, which is the feeder for the canal connecting the two streams.

- 5387 Major Suter states the lift of the lock at Fort Winnebago to be 7 feet, and the height of the Wisconsin above the Fox at this point to be  $9\frac{1}{2}$  feet. This fall of  $2\frac{1}{2}$  feet in  $2\frac{1}{4}$  miles is inadmissible in a canal for navigation, and is only allowable for supplying water-power. The guard-lock at the head of the canal communicating with the Wisconsin is also a lift-lock even at low water, and enables vessels to pass into the Wisconsin. To the preceding amount of elevation between the Wisconsin and



Lake Winnebago, as stated by Major Suter, must be added  $2\frac{1}{2}$  feet for the Portage Canal guard-lock, and he makes this allowance in his table of total elevations."

5544

SURVEY OF LIEUTENANT G. K. WARREN.

Page 1438.

In 1853, under direction of Lieut. Col. S. H. Long, a survey of the Rock Island Rapids was made by Lieutenant Warren, the report of which was transmitted to the House of Representatives May 20, 1854.

From Lieutenant Warren's report we gather the following:

"Louisville, Ky., April 6, 1854.

Sir:

Having completed the drawings of the rapids of the Mississippi, constructed from surveys made by order of Lieut. Col. S. H. Long, I have the honor to submit this report on the subject. The instructions required such surveys at the *lower rapids* (Des Moines), and at the upper rapids (Rock River), as were necessary to determine the best and most economical route along the bed of the river for forming a continuous navigable channel, 200 feet wide and 4 feet deep at the lowest stages. It is hardly necessary to state that this required an entirely new survey, the maps made in 1837 by Lieutenant Lee being on too small a scale to exhibit the character and extent of the channels and their obstructions.

5545

The time was too limited with the means at hand for a thorough survey of the river-bed, and it was determined, after a careful examination and consultation with some of the ablest pilots, to confine the more accurate survey to the vicinity of the channel now navigated. This channel is undoubtedly the most practicable one for improvement.

*Upper Rapids.*—These, beginning at half a mile above the lower end of Rock Island, extend 13 miles up the river. The principal reefs are known as Lower Chain (at foot of rapids), Rock Island Chain (2 miles from foot), Duck Creek Chain ( $4\frac{1}{2}$  miles from foot), Campbell's Chain ( $7\frac{1}{2}$  miles from foot), Saint Louis Chain (10 miles from foot); Sycamore Chain (12 miles from

foot), and Upper Chain. Unobstructed spaces intervene between these chains, the greatest being 2 miles, between Campbell's and Saint Louis Chains.

Much of the rock is a very friable limestone, and when quarried breaks up in the smallest pieces. A very soft yellow sandstone is also common and a little slate. Large granite boulders are found in many places.

Owing to the softness of the rocks composing the reefs, they have been much more worn away and dislocated by the ice and currents than at the lower rapids, and do not form as great an obstruction. Small steamboats drawing  $2\frac{1}{2}$  feet of water pass them at the lowest stages towing their barges. The navigation, however, is attended with great risk, and every year that has low  
5546 water sees several steamboats sunk and others seriously injured.

Duck Creek and Campbell's chains are particularly dangerous. The current is moderate at both (about 3 miles per hour), but the boat to avoid the prominent rocks is required to make such sudden turns as cannot often be performed, especially by stern-wheeled boats.

These two chains claim the earliest attention. Sycamore and Upper chains should have the next. Rock Island chain is a continuous flat reef across the riverbed, with a low-water depth of  $2\frac{1}{2}$  feet. To make 4 feet a cut through it 600 feet long will be required. The water was raised here about 10 inches by building the dams connecting the islands with the Illinois shore. The width of the river was thus considerably reduced. In the narrowest part it is but 400 yards wide. The average width of the rapids is about half a mile. \* \* \* The chutes behind Campbell's and Fulton's Islands are not navigable, and could not be made so as easily as the channel now used. But slight benefit would result from closing them. The only method of improving the upper rapids is to remove the rocks that now obstruct the channel and close some of the side chutes whose tendency is to produce cross-currents. The following tables show the amount of rock to be removed to make the present channel 4 feet deep.

5547

Davenport, Iowa, December 20, 1866.

Sir:

In obedience to your orders of the 5th of October, 1866, \* \* \* I have the honor to submit the following report, with the accompanying drawings:

I left Keokuk, Iowa, on the 6th of October, 1866, arriving at Davenport, Iowa, the next day, and immediately commenced organizing my parties, and in order that the work might be pushed forward with the greatest dispatch consistent with the importance of the work, and inasmuch as the season for work would be of short duration, I put into the field all the force that could work to advantage.

The hydrographic party was placed under the immediate charge of Mr. J. E. Abbott, civil engineer. Their work included all that related to the topography of the bed of the river, and other information concerning the flow of the water over the rapids.

5548 A large party was placed under the charge of Mr. W. D. Clark, civil engineer, with a view of making an accurate survey of the valley on both sides of the river, showing the meandering of the shores and gathering all other information necessary for the investigation of the several projects for the improvement of the navigation on the upper rapids. Lines of levels were run on both shores from a point about 4 miles below Rock Island to a point about 4 miles above LeClaire; perpendicular offsets connecting with the main line at various distances from 50 to 500 feet apart, according to the changes in the general feature of the shore, were run.

As the time allowed us would not warrant an entire resurvey of the bed of the river, and moreover, as General Warren's map, wherever tested, proved to be sufficiently accurate, I caused Mr. Abbott's party to restrict themselves at first more particularly to a thorough examination of the bottom on the chains, in order to get the most accurate possible data for estimating the amount of rock excavation necessary to make a channel of 200 feet width and 4 feet deep in low water. A favorable season has, however, enabled us to accomplish more hydrographic work than could reasonably have been anticipated.

The upper or Rock Island Rapids begin at a point near the lower end of Rock Island, and extend 14.26

mile up the river to a point near the lower end of the town of LeClaire. The bed of the river throughout this entire distance consists of a hard surface of limestone rock, worn in many places into deep furrows by the long continued action of the water and the material washed along the bottom. This rock crops out along the shores, 5549 and is generally found stratified in thin layers. The lower strata in the bed of the river appear to be harder, and of different thicknesses—from 4 inches to 2 feet and upward. There are also a number of large, erratic boulders of granite to be met with, but these, as a general thing, do not prevent serious obstructions, but in some cases as at Campbell's Chain, they rather serve as guide marks for pilots, who would protest against their removal on that account, unless replaced by other equally permanent marks.

The only difficulty in the way of navigating the rapids consists in passing over the chains, of which there are seven, viz.: the upper or Smith's Chain, Sycamore, Saint Louis, Campbell's, Duck Creek, Moline and lower chains. At these places the rocky bed of the river projects out from each shore like a bar, the projecting points sometimes overlapping each other, leaving only a narrow, tortuous channel between them, and in some instances extending like a dam or rocky bar entirely across the river. Between the chains, throughout almost the entire distance, is a wide and navigable channel, with plenty of water for boats that navigate the upper Mississippi and at such places the velocity of the current is much less than on the chains.

Between the head and foot of the rapids, a distance of a little more than 14 miles, nearly eleven miles, are good navigation in the lowest stages, the obstructed portion 5550 covering a distance of only more than 3 miles. \* \* \*

The steamboat channel, beginning at the head of the rapids, runs in close to the Iowa shore, with plenty of water till it strikes the upper chain, generally called by pilots Smith's Chain; here the channel is narrow, crooked and the current swift, having a velocity of more than 3 miles an hour. A large reef or rocky bar, known as Asprey Patch, stands in the middle of what would otherwise be a wide channel. This chain is not considered, however, as difficult or dangerous as most of the others.

Passing Smith's Chain, the channel inclines gradually towards the Illinois shore, until it comes to Sycamore Chain, which is conceded to be the most difficult place to pass on the whole rapids. Here the rocky ledges project out from each shore, leaving between them only a narrow and crooked waterway. The current being swift and the turns short, boats in passing are exposed to strong cross-currents, which tend to sweep them on the lower ledge; besides, in one of the sharp bends a deep pocket has been cut, and a large amount of water runs through it, which, by its action, tends to draw boats into it, where they sometimes become fastened, and to extricate them involves a loss of much time, and is a labor of great difficulty.

5551 The difficulties at Sycamore Chain are not the result of a want of sufficient depth of water, for there is a good depth in the channel, but they rise from its narrowness and crookedness, together with the strong cross-current that sweeps over it.

After passing Sycamore Chain, the channel runs close to the Illinois shore, passing inside of Crab Island, where it becomes very narrow, and then inclines toward the Iowa shore until, at Saint Louis rocks it reaches a point about mid-way between the Illinois shore and Fulton's Island. Passing the Saint Louis rocks, it again inclines toward the Illinois shore until it reaches Saint Louis Chain, where the channel becomes narrow again, but boats that pass the chains above or below this seldom experience great difficulty here. Below this chain the channel opens up gradually into a stretch of 3 miles, perfectly navigable at all times. In front of Hampton the current becomes quite sluggish.

Opposite the head of Campbell's Island the channel crosses Campbell's Chain, which is not only crooked and exposed to cross-currents, but the rocky ledge extends entirely across the river. In the channel pursued by steamboats across this chain the water is not much deeper than on either side of it. The slough behind Campbell's Island is not used for navigation.

5552 After passing Campbell's Chain, with the exception of the rocks near Winnebago Island, which are somewhat of an obstruction, the channel is wide and easily navigated until it comes to Duck Creek Chain, nearly 3 miles below. Here it is crooked and narrow, so much so as

frequently to necessitate the use of anchors at low water for the purpose of working boats through. This is another difficult chain to pass through.

Below Duck Creek the channel widens out again, giving good navigation, with the exception of one narrow place for about 2 miles, when it comes to Moline Chain. Here again the ledge of rock extends entirely across the river, and forms in low water an impassible barrier to boats, drawing more than 30 inches. The water passes over this chain at a mean surface velocity of 3.878 feet per second at low water, and a maximum velocity of 5.0545 feet per second, as determined by actual observation with floats.

The dams of Moline and Benham's Island cut off a large body of water that would otherwise flow out of the main channel, and the universal testimony of the pilots establishes the fact that they have raised the water on this chain some ten inches. It is generally conceded that the navigation has been materially benefited in low water, but the increased volume of water has no doubt increased the velocity of the current, also. During the low stages, however, when the velocity of the current is less than at high water, this increase is of little account in comparison with the advantages of getting the increased depth.

From Moline Chain the channel widens out again, becomes deep, inclining towards the Iowa shore, and is perfectly navigable for the largest boats on the upper Mississippi until it comes to the lower chain. The channel here is very crooked, but the current is not so swift as on some of the other chains, and consequently not so difficult to pass. This chain is about half a mile above the Chicago and Rock Island Railroad bridge, and no more natural obstructions present themselves below this point in the ordinary low stages. \* \* \*

The average length of the boating season is about 260 days. During the winter, as a matter of course, navigation is closed by the ice.

When the river is opened to navigation, about one-third of the whole time is rendered dangerous by the shoalness of the water on the rapids and sometimes impassable for boats drawing more than 2 feet. In the year 1864 the water was lower than has been known be-

fore in many years, attaining its lowest point September 2.

5554 From the record of the stages of water kept at the Chicago & Rock Island railroad bridge, it is found that the greatest range between high and low water during the last 7 years is 15 feet 9-1/2 inches, being the high water of 1862 and the low water of 1864, the mean range during the same period being less than 12 feet.

The range between the highest floods and the lowest water at other points along the rapids, from the best authority that could be obtained, are at Valley City, opposite Hampton, 13 feet 8 inches, and at LeClaire 12 feet, which, if correct, shows a diminution of only 3 feet, 9 inches, in the fall at high water as compared with that at low.

The average width of the river on the rapids is about 1/2 mile. At LeClaire it is only 1,500 feet in one place, but widens out above and below. Below the rapids the river is wider than on them, as may be seen from the map. A line of levels, from the head to the foot of the rapids, shows a fall of 21.46 feet in a distance of about 14 miles, or an average fall of 1.53 feet per mile in low water.

The greatest fall is on Moline and Sycamore chains.

The area of a cross-section at the head of the rapids, where the river is only 1,650 feet wide, is 30,220 square feet; at a point near Sycamore chains, 12,408 square feet; at Moline Chain, 6,829 square feet.

5555 Careful experiments were made on the velocity of the current in order to determine the amount of discharge over the rapids in ordinary low water. For this purpose the stations were taken and a number of velocities between them at different distances from the shore determined by floats; a mean of these was taken as the surface velocity.

The mean area of the two cross-sections at the stations was taken as the rear of the cross-section, and by applying this to D'Aubisson's formula for the approximate discharge of a river, it was found to be 36,456 cubic feet per second. The approximate discharge behind Campbell's Island was also determined in the same manner, and was found to be 10,726 cubic feet per second.

With the exception of the places where the bluffs ap-



proach close to the river the banks are usually steep and rocky. \* \* \*

5556 The question is often asked by men who have navigated this river during many years, and was once asked me by a very distinguished engineer, why I should be in such a haste to get 6 feet of water in this canal at low stage, when the radical improvement of the river is so far from being complete. There are two reasons for this: The first is that the falls of the Ohio are the worst obstructions on the whole river. The works, to give the navigation the relief which it deserves here, should be of a permanent character, and will cost a great deal of money. The normal depth fixed for the improved Ohio River near this obstruction is 6 feet at low-water. The works here should therefore be arranged for such a depth on general principles. The second reason is of more present importance than the first. Everyone who has any knowledge of this river knows that if there were no more water in the canal at the lowest stage than on the bars above and below it, it would fail just when every inch of water is needed in it, that is, when the river has risen 4, 5, or 6 feet above the lowest stage. As the river rises the surface of water in the canal rises equally with the surface of the river at the head of the falls. Now when the river rises above the lowest water stage and begins to be used by navigation, there is a rise of more than 1-1/2 feet on all the bars above and below for every  
5557 single foot rise at the crest of the falls of water surface of the canal.

If the depth of water in the canal at the lowest stage were therefore left at 3 feet, when there would be 7, 8 or 9 feet in it due to a rise, there would be 9, 10-1/2 and 12 feet, respectively, over the bad bars above and below. There would then be a deficiency in the depth of the canal of 2, 2-1/2 and 3 feet, respectively. But in determining the available depth of water through the canal, we should always allow at least 1 foot for mud to prevent delay. So that the real deficiency in the depth of the canal at these stages in comparison with what it should be would be 3, 3-1/2 and 4 feet, respectively, at such times. Now, the deeper boats can load at these stages the better it pays them. To keep them a less depth than 6 feet in the canal at the extreme low stage

of the river would be a great injury to commerce, and particularly from now until the whole river is improved.

5558 The Ohio River Basin, according to some bulletins relating to the census of 1880, which I have been able to see, still maintains its supremacy over any other of the portions of the great Mississippi Basin. It still yields enormous quantities of iron, steel, coal, petroleum, wheat, corn, oats, salt and tobacco, and its numerous manufacturing interests are on a steady and healthy increase.

The total internal-revenue collections for the fiscal year which ended June 30, 1881, were over \$135,000,000. Of this amount over \$87,000,000 were collected in the eight states which, wholly or in part, lie in this basin.

No toll has ever been paid on the Des Moines and Rock Island Rapids in the Upper Mississippi, and Congress has appropriated \$5,955,350 to improve them, against \$2,600,000 expended here.

In order to improve the navigation to Lake Superior, the Government in 1852 gave the State of Michigan 750,000 acres of land and the right of way to build a canal around the falls of Saint Mary's River, and has appropriated \$2,616,000 since for its enlargement and the improvement of the river.

As the work now stands, it is inadequate to serve the interests of the commerce of the Ohio River, and it will become more and more so each year until the additional works suggested by me are completed."

5559

"SPECIAL REPORT.

UNITED STATES ENGINEER OFFICE,

ROCK ISLAND, ILL., March 15, 1880.

GENERAL:

I have the honor to acknowledge the receipt of a letter from your office, dated March 9, 1880, containing a resolution of the House of Representatives calling for certain maps and reports in reference to a proposed widening of the Rock Island Rapids.

The accompanying map (Atlas, p. 3923) (For copy of said map see Appendix, .....), which shows the present 200-foot channel and the work required for increasing this width to 400 feet, was prepared last winter, but as

yet no reports on the subject have been made. I would therefore submit the following:

The Rock Island or Upper Rapids of the Mississippi River extend from Le Claire, Iowa, to Rock Island, Ill., a distance of 14 miles. The river over this reach consists of a succession of deep pools separated by chains of rocks, through which the water, in the course of centuries has cut irregular channels.

The fall from the head to the foot of the rapids is about 20 feet, giving a velocity of current of from 2 to 10 feet per second at the shoal places.

5560 Previous to improvement the rapids could not be passed by the larger class of steamboats at a 2-foot stage, and at medium stages boats drawing from 3 to 4 feet could only pass on calm days and by using extreme caution.

Congress caused a survey and report on the improvement of the rapids to be made in 1866.

In 1867 the work of excavation was commenced, in accordance with the approved plan, which was to give a channel over the chains 200 feet in width, with a depth of 4 feet below low-water of 1864. From 1867 to 1879, inclusive, \$1,150,650 were appropriated, for which sum about 90,000 cubic yards have been removed, virtually completing the above mentioned plan.

The work already accomplished has greatly benefited navigation, but still certain difficulties are met with.

1. The channel is so crooked that it is not practicable in its present condition to provide a system of lights, and the navigation of the rapids is suspended during the night.

2. The width of 200 feet is not sufficient to admit of 2 boats with barges passing each other, so that either the ascending or descending boat must wait in one of the deep pools until the other has passed through a cut.

3. A fresh breeze, acting against the very long and high Mississippi steamers, endangers, and a strong wind prohibits, navigation through the narrow channels.

5561 A. A large steamer ascending the rapids through the comparatively narrow 200-foot channels draws down the water to such an extent as to materially reduce the depth in the cuts, so that a 4-foot channel is not really available at all parts of the rapids during a low-water stage of the river.

The most available plan that can be suggested for overcoming these difficulties is, as shown on the accompanying map, to widen the present cuts, giving a new channel 400 feet in width. By this widening, the second and third difficulties would be done away with, the fourth would be greatly reduced, and by so straightening the channel as to obtain long reaches, lights could be established which would overcome the first difficulty.

To increase the width of the channel to 400 feet, giving a depth of 4-1/2 feet below low-water, which will insure a grade as low as that of the present cut, will require the removal of 299,811 cubic yards of rock, and will cost approximately \$1,258,866.

Boats drawing five feet can pass through the Des Moines Rapids Canal during extreme low water.

If it is deemed advisable to give the same available depth and a perfectly safe channel over the Rock Island Rapids, the cuts should be made 400 feet wide, and excavated to a depth of at least 6 feet below low-water of 1864. This would require the removal of 581,835 cubic yards of rock, which would cost approximately \$3,491,010.

5562 I have estimated the cost of removing rock at \$6 per cubic yard, which would be sufficient, provided an appropriation was large enough to justify the building of coffer-dams and a systematic method of working.

The plans present could undoubtedly be so modified during the progress of the work as to require cutting on but one side of the channel where it is now supposed to require cutting on both sides; such changes, when practicable, will reduce the estimated cost.

The interests of navigation of course require that in time all the proposed work shall be done, but as the obstructions at the Rock Island Rapids are made up of a succession of shoals, the improvement of each may be considered as separate, complete within itself, and benefiting navigation just so much.

The only point in connection with the proposed widening of the channel which has not yet been considered is the effect which the straightening and improving of present channel would have on the depth of the water and the rapidity of the current."

6337 ILLINOIS & MICHIGAN CANAL COMMISSIONERS' REPORT OF  
1900 EMBRACING A DOCUMENTARY HISTORY OF THE ILLI-  
NOIS & MICHIGAN CANAL.

This report by the Canal Commissioners is a printed vol-  
ume of 273 pages.

(THE DESPLAINES RIVER.

Data from the

"DOCUMENTARY HISTORY OF THE ILLINOIS AND MICHIGAN  
CANAL" PUBLISHED IN THE CANAL COMMISSIONERS' RE-  
PORT FOR 1900.

pp. 60-268.

ROUTE OF CANAL.)

From report of J. M. Bucklin, Dec. 18-1830.

6376 "From the mouth of the Chicago river to the point  
fixed upon as the entrance of the canal, there is no ob-  
struction whatever to its navigation by boats drawing  
under five feet for that distance, which is five miles, this  
river forms a perfect natural canal, its banks being low  
and of uniform heights and its waters supplied by the  
Lake." (Can. Com. Rep., 1900, p. 73.)

"Leaving the river at the point above mentioned, the  
line of the canal inclines towards the Regula (as will be  
seen by a reference to the accompanying map) and fol-  
lows along the margin of the Portage lake until it strikes  
the river Des Plaines at the ford, a distance of nine  
miles; the excavation throughout this distance will pass  
through a hard ferruginous clay (as has been ascer-  
tained by borings) at an average depth of 15.41 feet.  
From the ford of the Desplaines to the Ausoganashkee  
swamp, the line runs through the valley of the Des  
Plaines river, at an average elevation of 16.27 feet above  
the bottom of the canal. On this part of the route, which  
is nine miles in length, the excavation to the depth of  
6.27 feet is good consisting of sand and clay, but the re-  
maining ten feet composes almost a continuous map of  
limestone extending with little intermission from the  
ford of the Des Plaines to the end of the line surveyed, it  
it probably of the same character as that in the bed of  
the river, the upper strata only of which appear to be  
detached." (Can. Com. Rep., 1900, p. 73.)

"The Ausoganashkee or Reed swamp does not present

any insurmountable obstacles to the passage of the canal through it, although with the lake as a feeder, it must necessarily be attended with great expense. The canal is located immediately across its mouth, which is half a mile in breadth, the depth of the excavation rendering 6376a it expedient to select the most direct route. The surface of this swamp is 15.86 feet above the bottom of the canal, 9.80 feet above the level of Lake Michigan and 2.30 feet above the river Des Plaines at its low stage, the excavations through it will consist of  $5\frac{1}{2}$  feet of mud and earth and 10.36 feet of rock." (Can. Com. Rep., 1900, p. 74.)

"To carry the canal entirely through the deep cut which terminates about six miles below the Ausoganashkee will probably increase the above amount to two millions and a half, the great expense of time and money thus necessarily incurred in making a feeder of the lake renders it desirable to use for that purpose some stream by which the summit level can be better adapted to the elevation of the ground on the line of the canal. The river Des Plaines when low affords a very considerable quantity of water, but the Calamic river which empties into Lake Michigan about twelve miles south of Chicago, furnishes an abundant supply (320,000 cubic feet per hour) and is in every respect, so far as my observation extends, advantageously situated as a feeder. Too much time was necessarily consumed in the survey of the line of the canal to admit of as particular an examination of this river as from the facts collected respecting it, it undoubtedly deserves." (Can. Com. Rep., p. 74.)

"It is evident from the nature of the ground as well as from the representations of the inhabitants of the country, that there is in times of high water, a communication between the river Des Plaines and Calamic, through the valleys of the Ausoganashkee swamp and Stoney Creek, as neither of these rivers rise more than ten or twelve feet, and as there is no perceptible current between them when both are up, it is reasonable to conclude that the intermediate ground is low enough to admit of the waters of the Calamic being brought into the valley of the Des Plaines at a small expense, provided a dam can be made in the former at a sufficient elevation to give the feeder its proper descent."

THE SECTION OF LANDS UNDER THE U. S. LAND GRANT.  
From Reports of ROBERTS, JAYNE AND DUNN, CANAL COM-  
MISSIONERS.

December 27, 1830.

- 6377a "The commissioners selected each alternate section having an odd number, commencing with township No. 32 north range No. 1 east of the third principal meridian, within five miles of each side of the canal, making in all four hundred and ninety sections." (Can. Com. Rep., p. 76.)

PLATTING OF CHICAGO,

ITS COMMERCIAL IMPORTANCE.

- 6378 "That means might be realized as early as possible to commence the work of excavation, the commissioners determined to bring into market the remaining canal lands, on the 27th day of September at Chicago, and on the 4th day of October following at the rapids of the Illinois river. In the meantime they laid off into town lots part of section 9, T. No. 39 N., R. 14 E., lying on the Chicago river near Lake Michigan, and part of section No. 11, T. 33, N., R. No. 3 E., situated at the mouth of Fox river on the Illinois." (Can. Com. Rep., 1900, p. 77.)

"A portion of these lots were with the remaining canal lands (except fractional section 15, T. 39 N., R. 14 E.) after public notice given, offered for sale at the times and places specified. The report of the Treasurer before referred to, embraces a satisfactory and detailed account of these sales. The sales of lots in the town of Chicago on section 9, T. 39 N., Range 14 E., amounted to about \$4,363 and were so flattering as to inspire the Commissioners with a confident hope that the remaining lots, say about three-fourths, would with proper care and management, yield a very handsome increase to the canal fund. This town is situated on the Chicago river near its mouth and possesses many advantages, natural and advantitious. It is the only eligible site for a town on the lake shore within the limits of Illinois surrounded by a beautiful champaign fertile country, surpassed by none in the richness of its products and from the long



experience of its inhabitants is decidedly healthy. (Can. Com. Rep., 1900, p. 77.)

Its prominence in a commercial point of view has already prompted merchants from the northeastern part of the State and northwestern part of Indiana to take their produce to Chicago, ship for Detroit, Buffalo and New York and return by the same route, as the safest and cheapest. Saving on the transportation of goods 1.25 per hundred weight and performing the trip ten days sooner than by either of the other channels, through which merchandise is brought into these sections of the two States. The circumstances of Chicago being located at the head of the contemplated canal will make it the future depot of all the surplus products of the country on the Illinois river and its tributaries. These advantages point out its importance and at once elicit the fostering care of the Legislature of this State. Nothing would conduce more to the prosperity of this place than the construction of a safe harbor at the mouth of the Chicago river." (Can. Com. Rep., 1900, p. 77.)

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#### WATER SUPPLY OF RIVERS.

#### THE DEEP CUT AND SHALLOW CUT.

6378a

#### COST OF CANAL.

"From the estimate embraced in the engineer's report, it will be discovered that the cost of construction of that part of the canal, included within the points mentioned, will exceed one million and a half of dollars. This estimate is founded on the presumption that the water required, say four and a half feet in depth, is to be supplied from the Lake; and that the dimensions of the canal are twenty-six feet in width at bottom, with a slope on the sides (in earth) of one foot and three-quarters base to every foot perpendicular rise. The law on this subject has prescribed that the dimensions of the canal shall be as follows: "At least forty feet in width at the summit water line, twenty-eight feet wide at the bottom and of sufficient depth to contain at least four feet water." The difference in the dimensions assumed by the engineer, for the purposes of calculation, and those

prescribed by law, is so slight that the estimate predicted on the first may be safely relied on as appreciable to the latter." (Can. Com. Rep., 1900, p. 78.)

"The great expense of construction that must be incurred on the plan of using the waters of the lake to supply the summit level induced the commissioners to make such examination and inquiries as time permitted into the practicability of procuring a sufficient supply of water from some other source, that would raise the summit level sufficiently high to avoid rock excavation. It is believed that the river Calamie which emptied into the Lake about twelve miles south of Chicago, furnishes an abundant supply of water (320,000 c. feet per hour) and is in other respects advantageously situated for the purpose. Too much time was necessarily consumed on the canal line to admit of a particular examination of this river during last fall, but the information communicated by the engineer in his report and such observations as the Commissioners have been able to make, convince them of the practicability of the plan of using the Calamie as a feeder." (Can. Com. Rep., 1900, p. 78.)

"When we reflect that the cost of constructing the first eighteen and a half miles of the canal, will not, on this plan exceed \$160,000 and that on the other it will amount to more than a million and a half, the reason in favor of using the waters of the Calamie will appear too obvious to require comment. The report of the engineer is referred to for more satisfactory information on this subject." (Can. Com. Rep., 1900, p. 78.)

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#### RAILROAD VS. CANAL.

#### Act of 1831, Section 2.

- 6381 "It shall be the duty of the superintending commissioner, to cause the engineer employed by him, to ascertain as early in the spring as the weather will permit, whether the Calamie will be a sufficient feeder for the part of the canal between Chicago and Des Plaines river, "or whether the construction of a railroad is not preferable, or will be of more public utility than a canal." And if the commissioners shall seem satisfied of sufficiency of said river, and that a canal will be of more

public utility than a railroad, it shall be their duty to commence the excavations without delay. And if they should be of opinion that it would not, all further proceedings in relation to said canal and sales of land, shall be deferred until the next meeting of the Legislature." (Can. Com. Rep., 1900, p. 83.)

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FROM REPORT OF ACTING COMMISSIONER DUNN.

6382 "The engineer is of the opinion that 'the facts elicited  
by the examination of the route of the proposed canal  
are unfavorable to the practicability of its safe and  
6382a economical construction.' But represents that the route  
examined for a railway was found extremely favorable  
for the adoption of that sort of improvement. These  
statements of the engineer but confirm a conviction that  
I had for some time labored under." (Can. Com. Rep.,  
1900, pp. 85-86.)

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FROM REPORT OF CANAL COMMISSIONERS.

RAILROAD VS. CANAL.

"They regret that it is not in their power to make a report in detail. This cannot be looked for from them until they have all the means which the subject is susceptible of furnishing, necessary to satisfy the expectations of the public. They deem it a sufficient reason to say that the engineer in their employment has been constantly and indefatigably engaged in the execution of the work for nearly seven months past, notwithstanding the season were exceedingly unpropitious. But their convictions justify them in stating that the work has been executed with great pains and fidelity and which they think, merits, in reference to its accuracy, the confidence of the country." (Can. Com. Rep., 1900, p. 86.)

"It would be premature in the undersigned to say unqualifiedly that either one of the improvements contemplated should be preferred to the other, without the aid they would derive from the estimates of the cost. But from the convictions that at present influence them, they cannot hesitate to say that a railway on the route

referred to, is decidedly preferable to a canal." (Can. Com. Rep., 1900, p. 86.)

"The maps, profiles and estimates of a railway and canal will be made out by Mr. Bucklin without delay, but which will necessarily, however, occupy some time to enable him to accomplish this part of his labor. But we state it as our present convictions, undecided by his report, that unless there are some facts hereafter presented which we do not now anticipate) we should feel it our duty to recommend to the Legislature the adoption of a railway in preference to a canal." (Can. Com. Rep., 1900, p. 86.)

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#### WATER SUPPLY.

6383a FROM REPORT OF J. M. BUCKLIN, ENGINEER, JAN. 1, 1833.

"The discharge of the Calamie river in the fall of 1830 a season of extreme drouth, amounted to 320,000 cubic feet per hour, which may be safely relied upon as its minimum discharge. This quantity was considered sufficient for the upper portion of the canal, but by the late survey the length of canal to be supplied from the summit until relieved by the river Du Page proving to be much greater than was anticipated, an additional supply of 102,400 cubic feet per hour will be required for its consumption. The river Des Plaines in most seasons would alone make up the deficiency, but in the fall of 1830 its discharge was at one period reduced to 60,000 feet per hour. Relying upon its contributing this quantity of water in the dryest seasons, there will still remain a deficiency of 42,400 cubic feet for which there is no resource but the establishment of an artificial reservoir on the Summit Level. The Ausoganashkee swamp presents great advantages for this purpose, as it receives the drainage of the country to a great extent, and is susceptible at a comparatively small expense, of being rendered more secure from breaches and other casualties than most works of a similar description. It will form an area of 1,194 acres, capable of being filled to the average depth of ten feet and of containing a body of water more than adequate after the deduction of a large allowance for evaporation and leakage to all demands

made upon by the above mentioned deficiency. (Can. Com. Rep., 1900, p. 88.)

"Discharge of the Des Plaines river per hour in cubic feet 60,000."

6384 "The entire length of the canal being 92.75 miles there will then remain 56.25 miles to be supplied from other sources. Forty-one miles of this distance will devolve upon the river Du Page and the remainder upon Fox river. The river Du Page or Tokoquenone empties into the river Des Plaines 3.67 miles above its junction with the Kankakee. By an imperfect and hasty measurement of the Du Page in the fall of 1830, its minimum discharge was estimated at 415,000 cubic feet per hour, the succeeding summer and fall being remarkably wet did not afford an opportunity of ascertaining its discharge at a low stage, but it is obvious to the observer of both streams, that its discharge must, at all times, be greater than that of the Calamie. We may rely upon its capacity to furnish the same quantity of water, that is, 320,000 cubic feet per hour, from which deduct 246,000 cubic feet, the quantity required for evaporation and leakage in forty-one miles of canal at 6,000 cubic feet per hour for every mile, and there will remain a surplus of 74,000 cubic feet per hour, which being insufficient for the consumption of the remaining 15.25 miles, the waters of Fox river can be brought into requisition to supply the deficiency. As far as the results of experience can be applied in calculating the quantity of water expended by a canal located on ground of ordinary permeability, an ample supply of water is thus provided for the whole route. Nevertheless it must be acknowledged that in the upper levels where from the scarcity of water it is most important to restrict the loss of water within the usual limits, the canal passes through so rocky and porous a section of country that it is impossible to anticipate what may be the extent of the leakage or how far the precautions ordinarily adopted may succeed in enabling the canal to retain the water." (Can. Com. Rep., 1900, p. 89.)

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#### RAILWAY AND CANAL IN DES PLAINES VALLEY.

"Resuming the survey of 1830, at the Ausoganashkee swamp the line of the late survey continues in the south-

east valley of the river Des Plaines until within half a mile of Hickory Creek, it then crosses the river and encroaching upon its bed for a short distance to avoid rock excavation, is conducted by means of a narrow valley to Mount Joliet, where it falls in with the line of railway and terminates the second division, a distance of 19.75 miles. The rock excavation which forms a large item in the cost of this division, is occasioned by the gradual rise of the rock on the summit level, and the difficulty in procuring earth from embankment on the lower levels, which in some instances renders a depression of the level and the consequent excavation of the rock more advantageous than a continuation of the level and the

6384a substitution of embankment, although under the circumstances it would be preferable. The broad valley of this singular stream in places where it has much descent seems in its whole extent (far beyond the present rise of its waters) to have been swept bare of everything that was not sufficiently ponderous to resist the effects of a violent current. In these situations with the exception of occasional mounds of gravel, materials for embankment cannot be found within a distance that would justify their use except in a case of absolute necessity. Besides the expense accruing from these causes, the cost of keeping this part of the canal in repair after it is finished, must be necessarily great on account of the immense deposits of earth and the breaches to which it will be annually subjected by the numerous small streams which intersect the route and must be received into the canal as they cannot be passed under it or disposed of in any other way. The whole line is more or less exposed to this defect, but it is of more frequent occurrence in this division than in any other part of it. It is here that the rocky district of the country before alluded to, as exciting so much apprehension respecting its probable effect in exhausting the supply of water is situated. (Can. Com. Rep., 1900, p. 90.)

“The third division which is included between Mount Joliet and the river Au Sable (a distance of 15.234 miles) affords a better location than the preceding. With the valley of the Des Plaines it pursues on very favorable ground, a southerly course from Mount Joliet to the river Du Page which it crosses some distance above its mouth, receiving a feeder from it on the north side. Beyond

this point, the bluffs, just above the confluence of the Kankakee and Des Plaines rivers oppose serious obstacles to the construction of an economical and permanent work. On this section of the division the level is unavoidably too low to admit of the passage of many of the small streams under the canal by which means and the drainage from the hills, it will be subject to the same inconveniences and danger in wet seasons to which the division above is exposed. The soil also from being mixed with sand adheres together very slightly and when saturated with water has a great tendency to slip over where the inclination of the hill is moderate. Considerable embarrassment to the navigation of the canal may be expected from this cause besides the expense of repairs." (Can. Com. Rep., 1900, p. 90.)

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#### DEEP CUT PLAN

#### ROCK EXCAVATION

#### USE OF DES PLAINES.

- 6385 "In making a feeder of Lake Michigan, by cutting through the dividing ridge between the lake and the head waters of the Illinois river the location of the canal is the same throughout as the foregoing, it being important in both plans to choose the lowest ground for the Summit Level, the arrangement of the lower levels being governed by the same indications in each. In the survey of 1830 of the upper part of the route, assuming the bottom of the canal at the head of the Chicago river, to be four and one-half feet below the level of the lake, no rock excavation is encountered until the line strikes the river Des Plaines, where it was ascertained by the boring to average about ten feet and the earth excavation about six feet in depth throughout the remaining distance of nine miles. By the late survey, beyond the Ausoganashkee Swamp, the rock excavation was found to increase in depth for several miles, on account of the greater elevations of the rock which I have before had occasion to advert to in describing the location of the second division. The divisions of the route upon this plan, are the same as in the former, of which first and second division it will be observed by referring to the



estimates, are liable to any increase in the cost of construction, arising from the difference of plan, yet this increase amounts to upwards of two millions and a half, a fact that may be thought sufficient of itself to put the execution of the work on this plan entirely out of the question. Still it may not be superfluous to remark that although in the estimate of the probable cost of the work, a liberal place is allowed for the rock excavation, the most important item; besides a sum amply sufficient to cover the ordinary contingent expenses, yet it is hardly possible to anticipate the limits of the expenditure when we consider that the bulk of the rock excavation lies below the rocky bed of the river Des Plaines and the interruption that the work will consequently be liable to form the water of the river finding its way through the numerous fissures of the rock into the canal." (Can. Com. Rep., 1900, p. 91.)

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DES PLAINES RIVER—WHY NOT USED FOR CANAL—RAILROAD PREFERRED.

6385a "It has been also proposed to effect a water communication between the Lake and the Illinois river by means of dams and locks in the river Des Plaines, forming a still water navigation, knowing the minimum discharge of this river, the impracticability of the scheme is so evident that the subject is here noticed more as a matter of form, than with any expectation of rendering it clearer. It will be recollected that the quantity of water provided for the passage of 96 boats over the Summit Level every 24 hours in the canal, is 86,400 cubic feet per hour, that is one lock chamber full of water every 15 minutes, ascending and descending." (Can. Com. Rep., 1900, p. 92.)

"The minimum discharge of the river Des Plaines, is only 60,000 cubic feet per hour. Of course, it is not competent to supply even the lockage (which on this plan cannot be less than that required for the canal) without taking into consideration the loss by evaporation and leakage, which would alone consume at least seven times the quantity of water discharged by the river Des Plaines at its lowest stage." (Can. Com. Rep., 1900, p. 92.)

## ANY WATER COMMUNICATION WHATEVER THOUGHT IMPRACTICABLE.

"In the rocky and cavernous district of country to which the location of the great part of the route of the canal is confined, there are too many difficulties to be reasonably apprehended in carrying it into successful operation, to justify the establishment of a water communication on any route or plan whatever, while however, so many obstacles are opposed to the construction of a canal, the examination of the route for a railway was very successful in developing its great advantages for the adoption of that species of improvement. The line of the canal commencing at the Chicago river and occupying the south bank of the river Des Plaines, being of very exceptional character for a railway, and the inclination of the grades of the latter admitting of greater latitude in its location, the route for a railroad was commenced at the junction of the north and south forks of the Chicago river in the town of Chicago on Lake Michigan, and from thence run in a sight line through a level open prairie, north of the Portage Lake to the upper ford of the river Des Plaines, commonly called Laughton's ford, a distance of ten miles from Chicago; it crosses the river at this point which is advantageously situated for that purpose, and pursues the northwest valley of the river Des Plaines until it forms a junction with the line run for a canal, a short distance below a remarkable natural mound called Mound Joliet, 38.258 miles from Chicago. This distance includes the 1st and 2nd divisions of the line of the railway, the remaining part of the route (57.742 miles) corresponds in the limits of its division with those of the canal, although the location is not entirely the same, the inclinations of the railway frequently allowing a better selection of ground than that to which the levels of the canal are confined." (Can. Com. Rep., 1900, p. 92.)

"The graduation of the first ten miles through the Chicago prairie, generally conforms to the surface of the ground which varies in its inclination from 2 to 13 feet to the mile. The want of stone and timber which

exists on this part of the line can in a great measure be obviated by commencing the construction of the railway at the river Des Plaines, where these materials can be obtained in abundance, stone or a very good quality. The estimates of the probable cost of this section of the 1st division are founded upon the adoption of this expedient for lessening the cost of the transportation of materials. Beyond the river Des Plaines, the 1st division extends to Flag Creek which empties into it 9.618 miles below the upper ford. The ground upon which this part of the line is located, is generally very level, the graduation which does not require much excavation or embankment, not exceeding 13 feet to the mile. Curves are, however, frequent, but not very abrupt, the minimum radius of curvature being 955 feet. Materials are found in sufficient quantity in the vicinity of the line." (Can. Com. Rep., p. 92.)

"Crossing the above mentioned creek obliquely about a mile and a half above its mouth, the line of the railway descends the valley of the creek to that of the river Des Plaines, where it continues its course until it strikes a succession of swamps, occupying the whole breadth of the valley of the river and running nearly to the top of the bluff. They are about two miles in extent, but from the favorable circumstance of their being generally shallow with a rock foundation, no great difficulty of expense is anticipated in passing them by an embankment. The line as first run, in order to avoid them as much as possible and to obtain firm ground, ascends the side of the bluff which involves the necessity of a graduation of 24 and 31 feet to the mile, but as the survey of the entire line has developed the fact that 20 feet to the mile may be considered the maximum rate of graduation on every other part of the route it becomes necessary even at a great increase of cost to equalize the graduation at this point. For whatever propelling power is used on the road it will, of course, be calculated to overcome the greatest resistance to be met with on any part of the road, consequently it is of great importance to avoid the necessity of providing a propelling power to overcome an ascent of 31 feet to the mile at one point only, while on no other part of the route a greater power is required

than that necessary for an ascent of 20 feet to the mile." (Can. Com. Rep., p. 93.)

- 6387 "In reviewing the capabilities of the country between Chicago and the foot of the rapids of the Illinois river for the construction of a canal or railroad, it would seem (laying aside the great difference of expense) that the obstacles opposed by nature to the foundation of a good canal on any route or plan whatever, are such that nothing could justify the undertaking, but the fact of its being the only means of attaining the accomplishment of so important an object as the improvement of the communication between the above mentioned points. For this reason the unparalleled advantages presented on the route of the railway for the construction of a very perfect and prominent work, are invested with additional value in inviting the adoption of an alternative, the ultimate success of which is warranted by experience in the successful operation of many similar works both in Europe and the United States, none of which can compete with it in economy of construction or perfection when finished." (Can. Com. Rep., 1900, p. 95.)
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#### EFFECTS OF THE RAILROAD SCHEME

#### CANAL COMMISSIONERS ABOLISHED

#### MEMORIAL TO CONGRESS BY STATE LEGISLATURE

- 6391a An Act to Abolish the Office of Canal Commissioners. Approved March 1, 1833.

"The General Assembly of the State of Illinois in session December 20th, 1832, adopted the following memorial:

"To the Honorable, the Senate and House of Representatives of the United States in Congress Assembled:

"The memorial of the General Assembly of the State of Illinois, respectfully represents, that by 'An act entitled an act to grant a quantity of land to the State of Illinois for the purpose of aiding in opening a canal to connect the waters of the Illinois river with those of Lake Michigan, approved March 2d, 1827,' Congress

has granted to this State a quantity of land, on the line of the proposed canal, to assist in the accomplishment of the work. Since the passage of this law, the State has caused the route to be surveyed, and the cost of the work to be estimated, from which it appears that the expense will greatly exceed the amount originally contemplated; that a railroad or turn-pike will be, upon the whole, more useful and less expensive, and can be accomplished in much less time. Nevertheless, the act of Congress limits the donation to the purpose of making a canal so as to restrict the Legislature from making any other application of it. Your memorialists therefore pray your honorable body to pass an act enabling this State to apply this donation to a turnpike, railroad or canal, as either of them shall be found to be most advantageous or convenient." (Can. Com. Rep., 1900, p. 104.)

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FROM ACT OF CONGRESS APPROVED MARCH 2, 1833.

6392 "Provided, That if a railroad is made in place of a canal, the State of Illinois shall be subject to the same duties and obligations, and the government of the United States shall be entitled to, and have the same privileges on said railroad, which they would have had through the canal, if it had been opened." (Can. Com. Rep., 1900, p. 105.)

"Approved March 2, 1833."

"In January, 1835, the General Assembly of Illinois passed an act entitled 'An act for the construction of the Illinois and Michigan Canal.' Under this act Governor Joseph Duncan nominated Edward Coles, president; Gurdon S. Hubbard, Joel Manning, William Linn, and William B. Archer, commissioners, who were duly confirmed as the Board of Canal Commissioners. This act, however, proved defective in so many particulars that nothing was accomplished by this commission." (Can. Com. Rep., 1900, p. 105.)

"From 1831 to 1835 a strong effort was made to secure the construction of a railroad instead of a canal. This effort, however, while it was advocated by many of the leading men of the State, met with little encourage-

ment from the people." (Can. Com. Rep., 1900, p. 105.)

"The Congressional acts of 1827 and 1833 extended the time limit for commencing the canal to 1837 and for its completion to 1852, it being apparent at this time that prompt measures must be taken for the commencement of the canal or the rights under the act of 1822 and 1827 be lost and the land grant of 1827 thereby revert to the general government; that the Governor of Illinois by proclamation convened the General Assembly in special session December 7, 1835.

A CONTINUOUS CANAL AS AGAINST SHORT CANALS AND  
RIVER IMPROVEMENT.

6394

"Chicago, June 23, 1836.

To the Honorable, The Canal Commissioners of the  
State of Illinois.

Gentlemen:—

At a meeting of the citizens of the town of Ottawa the undersigned were appointed a committee to address a note to your board to ascertain whether it is contemplated by you to cause a survey of the Illinois river or any part of it to be made, in order that estimates may be made with a view to its ultimate improvement for slack water navigation." (Can. Com. Rep., 1900, p. 109.)

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PRESIDENT TO CITIZENS OF OTTAWA.

Canal Office, Chicago, July 11, 1836.

Committee of the Citizens of Ottawa.

Gentlemen:—

Your communication of the 23d ult., was laid before the board of canal commissioners at their first full session, after the receipt of it, and I hasten to apprise you of the result. You inquire 'whether it is contemplated by the board to cause a survey of the Illinois river, or any part of it, to be made with a view of its ultimate improvement for slack water navigation,' and we presume that you allude more especially to that part of the river lying between Ottawa and the western boundary of the canal lands."

"By reference to the 44th section of the act for the construction of the Illinois and Michigan canal approved the 9th of January, 1836, it will be seen that the Legislature have ordered the canal to terminate "at or near the mouth of the Little Vermillion river, in Lasalle country, and on lands owned by the State."

"When this act was passed, the question was not new, whether a continuation of the canal or an improvement of the river below Ottawa by lock and dam was most advantageous to the general interest. The Legislature had accumulated a large fund of information in order to judge of the comparative advantages and disadvantages of each plan, both in relation to the safety and stability of navigation, and to the increased revenue derivable from State property by terminating the canal as low down the river as was contemplated in the grant of lands from the Government of the United States. Nor can it be doubted that the tenor of that grant had some influence on the decision." (Can. Com. Rep., 1900, p. 109.)

6394a "The commissioners shall have power, says the law, to cause an engineer to examine the Illinois River, from the mouth of Fox river, down to the head of steamboat navigation; and if, in their opinion the navigation of the Illinois can be improved by locks and dams, or otherwise, so as to secure its navigation as far upward as the mouth of Fox river, with as little expense and as much utility as cannalling from the Fox river to the Little Vermillion or the foot of the rapids, they shall have power to terminate said canal at mouth of Fox river." In 1833, the same engineer reported that a comparatively good route could be obtained for the continuation of the canal from the mouth of Fox river to a place now known as Utica and that great difficulty and expense would attend a further progress. In examining the rapids of the Illinois below the mouth of Fox river he says,

"It was ascertained that the establishment of a still water navigation was the most certain and effectual method of improving them." But in his zeal to demonstrate the superiority of a railroad over either mode of water communication, he admitted a steamboat canal around the rapids, "to be of too precarious a nature to be recommended with any degree of confidence in



its permanency and usefulness." He estimated an independent canal between Fox river and Utica at \$580,000; and a still water navigation of the same distance at \$200,000; and it is worthy of remark that notwithstanding this great disparity of cost necessarily enhanced by the difficult country between Utica and the mouth of the Little Vermillion, the Legislature have thought proper to repeal the eighth section, just cited, and to adhere to the first plan. In fact, they have presented the termini in language not to be misunderstood, while they have given great latitude and almost everything else connected with the subject, hence the commissioners deem themselves unauthorized at this time to cause a survey of the rapids of the Illinois river" "with a view of their ultimate improvement for slack water navigation"; nor would they be justified to any premeditated suspension of that particular line for the sole purpose of bringing the matter again before the Legislature, unless the engineers (who have recently ascertained that a safe canal and suitable termination are entirely practicable) should prove by their estimates that the cost will so far exceed any previous calculations as to render it prudent, on the part of the commissioners, to report that fact to the Governor and pause for additional legislation." (Can. Com. Rep., 1900, p. 110.)

6395 "Taking this view of the subject, the commissioners can make no pledge " "To cause any part of the river to be surveyed, with a view of slack water navigation," except in the contingency before mentioned or, in the further one, of the Fox river feeder, and the division along the Rapids not being not under contract during the present season. Should either of those events take place, an accurate survey from Ottawa down will be made this fall when the water is low, and plans and estimates submitted to the Legislature." (Can. Com. Rep., 1900, p. 111.)

"In coming to this conclusion, the board of commissioners are influenced, in the first case, by the consideration that if a continuous canal should be shown to be too costly for its benefits, a still water navigation will be the only alternative; and in the second case, by their anxiety to do everything consistent with their duty, to promote the interest and gratify the wishes of the enterprising citizens of so important a town as Ottawa. A

point in which the State is deeply concerned and one which, in no event, can fail to arrive at immense consequence." (Can. Com. Rep., 1900, p. 111.)

"With great respect, gentlemen, I remain,  
Your obt. servt.

W. F. THORNTON,  
*President Board Comms. I. and M. Canal.*

Messrs:

Benj. H. Moore  
James Day  
Loring DeLano  
Benj. Harris  
Bartley Denison  
Wm. E. Armstrong  
Geo. H. Norris  
David Lith  
Henry Green"

(Can. Com. Rep., 1900, p. 111.)

FROM ANNUAL REPORT FOR-1836.

6396 "In the very threshold of their administration, the board were met by appalling difficulties, involving the highest official responsibility, and the most vital interests of the State. They soon became convinced that the magnitude of the undertaking had been miscomprehended both by the Legislature and the people. The largest estimate that had been previously made was about four millions of dollars; and without regarding the enlargement of the plan or the increased value of the means of execution, it was confidently asserted by many members of the Legislature and other citizens, whose opinions were entitled to weight, that even that estimate was far beyond the truth."

"The commissioners had just begun their inquiries when they became satisfied that the four millions would be wholly inadequate; and before they had determined on any definite location, they saw that if the spirit of the law was adhered to, double that sum would be required. The seventeenth section of the act says that "the canal shall be supplied with water from Lake Michigan, and such other sources as the commissioners may think proper." In other words, Lake Michigan must be a feeder; and consequently the water of the lake must be

carried into the valley of the Des Plaines by a through cut, chiefly in stone, of eighteen feet deep, on an average and nearly thirty miles long. It was upon this plan that Mr. Bucklin made his four million estimate; but his canal was to be forty feet wide at the surface, twenty-eight feet base, and four feet deep; while the present law requires "not less than forty-five feet of water surface, thirty feet base, and a sufficient depth to insure a navigation of four feet." It is to be constructed, too, in the manner best calculated to promote the permanent interest of the country, and a discretionary reservation is authorized on each margin with a view to future enlargement." (Can. Com. Rep., 1900, p. 113.)

6396a "To the difficulty which this view of the subject presented, another was added which exercised a strong influence on the movements of the board. It was at first believed by men of experience, and countenanced by the engineer, that steam power would have been freely resorted to in order to divest the Summit level works from the water which might probably flow in through the fissures of the rocks; and that the necessity of such a resort would not only increase the expense of excavation, but deter contractors from making acceptable proposals. Under the circumstances, the board came to the conclusion that if it were practicable to obtain ample feeders from other sources than the lake, they would direct their operations for the present year to some other division of the work and call the attention of the Legislature to a change of plan. The Calumet and the Des Plaines having been ascertained to be insufficient, the upper region of the Fox river, as the only remaining chance, was ordered to be examined; but after a brief, yet convincing, investigation, the project was abandoned. A reference to the engineer's report will afford all the particulars of the exploration. (Can. Com. Rep., 1900, p. 114.)

"Nothing now remained but to go through the Summit level, or suspend the whole work. (Can. Com. Rep., 1900, p. 114.)

"The next question to be decided was the size of the canal. After mature deliberation the board determined to adopt the recommendation of the chief engineer, and construct it of the following dimensions, to-wit: Sixty feet wide at the top water line, thirty-six feet wide at

the bottom and six feet deep. The fluctuation, or irregular tides, in the lake, occasioned by the action of high winds rendered the depth agreed upon indispensably necessary to insure a navigation of at least four feet, and the commissioners were decidedly and unanimously of the opinion that the adopted width was that "best-calculated to promote the permanent interest of the country."

. . . . .

"There is no avoiding the stupendous cost through the Summit Level. Water must be drawn from Lake Michigan and that water will be of great value, as well for the improvement of the river navigation as for hydraulic purposes. The greater size of the canal will facilitate the passage of canal boats, overcome their burden and cheapen freights. It must have, too, a beneficial effect upon the prices of land and town lots owned by the State; such an effect, in fact, was clearly perceptible at the recent sales in Chicago, and will doubtless be felt at every other point." (Can. Com. Rep., 1900, p. 114.)

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THE MACADAM AND PLANK ROAD ACROSS THE SWAMP FROM  
JOLIET TO CHICAGO.

6398a "But the heaviest item in the contingent account is the Saganashkee road, amounting to \$..... At the very commencement of operations it became evident to the board, that, owing to the total absence of a road along the route of the canal, which passes, for several miles, through marshy wet prairie, and heavy timber, some steps must be taken to secure free access to the line, at all seasons of the year. Without it, hardships would at times, be much retarded, and contractors would naturally seek to indemnify themselves by increased prices. At the instance of the acting commissioner he was therefore authorized to make such improvements as, in his opinion, were indispensably necessary. It was believed at that time, that five or six thousand dollars would accomplish the object; but the plan was afterwards extended to its present condition and cost upon the individual responsibility of the acting commissioner. He was confident that a proper discharge of his duty, as the immediate superintendent of the canal, warranted

the expenditures; and the other members were unwilling to withhold the means which the nineteenth section of the law would seem to sanction. The board is unanimous, however, in opinion, that the State will eventually be more than reimbursed by the advantages derivable from so useful a highway." (Can. Com. Rep., 1900, p. 118.)

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FROM REPORT OF CHIEF ENGINEER WM. GOODING, Dec., 1836, EFFECT OF CANAL ON THE RESERVOIRS FEEDING THE DES PLAINES.

6399 "Two lines of levels were run across the country lying between Chicago and the Des Plaines river, near the mouth of Portage or Mud Lake, the one commencing near the mouth of a broad slough, on the north fork of the south branch of Chicago river, at the point where the former canal surveys were commenced, the other on the north branch of said river and a half mile above the point or the junction of the north and south branches." (Can. Com. Rep., 1900, p. 119.)

"The former line or the route of the old surveys was found to be far the most favorable, the distance for which the through cut would have to be made, and the depth of cutting being much less. This line passes over the ground but little elevated above the surface of Portage lake at an ordinary stage of water, and which is mostly inundated during the floods of the Des Plaines, the waters of which, it is well known, frequently flows across this low country into the south branch of Chicago river. A particular examination was also made of Portage lake and of the Des Plaines river with the view of occupying portions of each with the canal should the result prove favorable. But it was found that no saving could be effected by such an arrangement. Portage lake is a succession of ponds on the same level, connected with each other and with the Des Plaines river, and extending about six miles toward Chicago river, nearly in the direction of the canal line. The surface of the water at an ordinary stage is 10½ feet above Lake Michigan and the mud in the bottom is generally found 5 to 6 feet above Lake Michigan or from 11 to 12 feet above bottom of canal. To excavate the canal to the requisite depth

through these ponds and the marshes on their borders, would be attended with great difficulty and a cost far exceeding that of making the through cut along the borders of the marshes on ground more favorable."

"The examination of the Des Plaines river resulted no less unfavorable than that of Portage lake. The bed of this stream for  $13\frac{1}{2}$  miles below the point where the canal line enters the valley, except in a few places and for short distances only, is from 8 to 12 feet above bottom of canal, and nothing whatever could be gained by occupying any portion of the channel, as the difficulty of disposing of or keeping out the waters of the river to make the necessary excavation would more than balance the diminution of the quantity to be excavated by such a location." (Can. Com. Rep., 1900, p. 119.)

- 6399a "From the examinations made it soon became apparent that the Summit division was likely to prove far more expensive than any former estimate had made it, and it was believed that if a permanent and adequate supply of water could be provided without cutting down the Summit so as to introduce the waters of Lake Michigan, a change in the existing law should be recommended to the legislature of this State at its next session." (Can. Com. Rep., 1900, p. 120.)

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#### SUMMIT DIVISION.

- 6400 "This division extends from the north fork of the south branch of Chicago creek to the first lock and is also made to include the creek or river section of five miles and 44 58-100 chains in length. The length of the river section is computed from the pier at the mouth of the river to the commencement of the through cut at "the mouth of the broad slough" on the north fork of the south branch on the line as located for the June letting. Towing path, however, is only estimated from the point on the junction of the north and south branches, and will be constructed on the south side of the south branch four miles and sixty-four chains, where it will cross by a towing path bridge at the mouth of the north fork, up which it will continue to the mouth of the slough before mentioned. Little expense will be required except for the towing path until the south branch is crossed, when it

will become necessary to cut off some points, and in some places to deepen the channel between the mouth of the north fork and the commencement of the through cut." (Can. Com. Rep., 1900, p. 121.)

"But the law requires that the canal should commence on canal land, and if the branch thus improved be not considered canal, it will be necessary to continue the through cut to the south branch, increasing the length of independent canal forty-eight chains or otherwise the law should be so changed as to permit the most judicious location practicable, which is believed to be on the route first described. A survey has, however, been made in pursuance of instructions received, from a point on the south branch  $4\frac{1}{2}$  chains above the crossing proposed at the mouth of the north fork to a point near the Des Plaines river where the line first run, and upon which the estimates were made for the June letting, is intersected. Both these lines from the point of starting to the intersection, are straight and occupy similar ground. Upon the first route to the straight line is  $7\frac{1}{2}$  miles in length, and upon the other route eight miles and eight chains." (Can. Com. Rep., 1900, p. 121.)

"The prairie over which both lines pass is very level, and extremely wet except in times of severe drought. The cutting is generally from seventeen to nineteen feet, through a stiff blue clay."

"Below the intersection of the tow lines the canal route is down the valley of the Des Plaines. This river for thirteen or fourteen miles has very little descent, the current at low water being scarcely perceptible, and the land so low along its borders as to be overflowed by every rise of water."

"After the line enters the valley the direction is changed by a gentle curve and another straight line obtained of three miles and fifty chains in length. Several other long straight lines are obtained on this division and the curves may all be gentle and uniform."

"The depth of cutting continues about the same down the valley to Brewer's ford as across the wet prairie from Chicago river to the Des Plaines, but the canal will be much more expensive as the excavation is principally rock. The depth of earth on the rock above the mouth of the Saganaskee swamp was found to be much less than was anticipated and less than was represented



in Mr. Bucklin's report but he may have found a more favorable line than that upon which our examinations have been made."

"A different section of canal is presented in crossing the mouth of the Saganskee swamp where there is earth to a depth of five or six feet the most of which is a semi-fluid resting on rock. The cutting is here about seven-teen feet." (Can. Com. Rep., 1900, p. 121.)

"From this point to the first lock the rock is generally near the surface and a definite location has been made which it is believed is susceptible of little improvement. The level runs out a short distance after crossing Big Run which is about  $1\frac{1}{4}$  miles above the first lock and in the bed of which the cutting is two feet. This must, of course, be taken into the canal. (Can. Com. Rep., 1900, p. 121.)

6400a "No estimate has been made for cutting down the towing path as the whole drainage of a considerable extent of country on the southeast side of the canal must be received into it, and it was believed that this would sometime be nearly filled so that a towing path below the surface would be useless." (Can. Com. Rep., 1900, p. 122.)

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#### THE DUPAGE-DRESDEN SECTION.

##### NATURE OF THE CONSTRUCTION.

##### ENGINEER GOODING'S SUGGESTION THAT THE RIVER BE USED.

6401a "About two miles below the crossing of the Du Page a very difficult and expensive portion of the line commences and extends nearly to Dresden, below the mouth of the Kankakee river. The bluffs which are from 100 to 150 feet in height approach the river so as to be washed by it at their base, and the towing path bank which will be partly or wholly built in the river at the base of the bluffs will require slope wall to protect it against abrasion from the flood waters of the river, for an aggregate distance of 2 miles and 50 chains." (Can. Com. Rep., 1900, p. 124.)

"The most expensive portion of this difficult section commences a short distance above the mouth of the Kan-

kakee river, and continues to the termination of the bluffs. The base of the towing path will be wholly in the river, and the embankment must be formed by earth taken either from the top of the bluff or from the opposite side of the bluff, for the excavation of any portion of the prism of canal in the bluff would increase its tendency to slip and consequently endanger the canal." (Can. Com. Rep., 1900, p. 124.)

"Heavy protection wall will here be required to resist the force of the ice floods of the Kankakee, but it is believed that the estimate of cost presented is sufficient to construct a canal as permanent as it can well be made along clay bluffs which seem so much inclined to slip."

"Another mode of passing the bluffs may be worthy of examination before a final location is made of this part of the line between Dresden and Marseilles."

"A dam may be built at the foot of the bluffs and a towing path constructed along their base so as to pass this difficult portion of the line by slack water at much less expense than the present estimate of an independent canal, and would, undoubtedly, be quite as secure an improvement. By raising the water 15 feet (and a dam of this height can be rendered perfectly secure for there is a good rock foundation) the line would be thrown  $10\frac{1}{2}$  feet lower than the survey made to lock No. 8, of 8 feet lift between the Aux Sable river and Nettle creek, and  $2\frac{1}{2}$  feet lower than the line surveyed from this lock to locks Nos. 9 and 10, short distance above Marseilles. This would involve the necessity of a change in the plan of crossing the Aux Sable, an aqueduct having been estimated and a dam being required, if the plan suggested hereafter be adopted, and the river would be crossed considerably further down. The line below Dresden would probably be rendered more expensive than it is shown by the present estimate, and some damage would be sustained by the overflowing of land about the mouth of the Du Page, but how extensive this damage would be, how much expense would be saved at the bluffs, and how much additional cost encountered below, are all matters of future investigation." (Can. Com. Rep., 1900, p. 124.)

6402a

## LOCATION OF WESTERN TERMINAL.

"The termination of the canal is made on the corner of section 21 in township 33, N. R. 1 east of the 3d principal meridian. (Can. Com. Rep., 1900, p. 126.)

6406

HOW ENGINEER GOODING'S SUGGESTION WAS ACTED ON.  
SHALLOW CUT HIGH LEVEL WITH RIVER FEEDERS.

"This communication and the reports of the canal Commissioners and their engineer were referred to the committee on canal and canal lands, who on the 15th day of February, 1837, submitted the following report:"

"The committee on canal and canal lands, to which was referred the message of the Governor transmitting the annual report of the canal Commissioners; also a report of the committee on roads and canals of the House of Representatives, have had the various matters submitted to them under consideration, and submit the following as the result of their deliberations."

"From the examinations of those documents it will be seen, that the questions presented for consideration naturally bring before the committee inquiries touching the whole course of many years' legislation upon the subject of the canal. Questions which ought long since to have been investigated and definitely settled, and which it must be presumed have been fully considered and decided upon by previous legislative bodies, are again presented with the view of an almost entire change and total reversion of all previous legislative action. The committee have not thought proper to assume the correctness of the policy and measures heretofore adopted without investigating the facts and reasons urged in favor of the change. In proceeding to the investigation of this subject, the committee will endeavor to divest themselves of all prejudice in favor of preconceived opinions, growing out of previous action in their legislative capacity upon the same subject. It is deemed proper, however, to state that in the opinion of the committee it is incumbent upon those urging and proposing changes of action upon a subject of such vast importance to show that such changes are practicable, and are consistent with the public faith, and the character and dig-

nity of the State. The first change proposed by the committee of the House is upon the Summit division of the canal line, thirty-two miles in extent." (Can. Com. Rep., 1900, p. 133.)

(1) SHALLOW CUT HIGH LEVEL WITH RIVER FEEDERS.

"The proposition is to adopt the high level, as run by Mr. Bucklin, ten feet above the surface of Lake Michigan using the Calamie and Desplaines rivers for feeders."

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(2) IMPROVEMENT OF ILLINOIS RIVER TO HEAD OF LAKE JOLIET.

"The second is, to substitute the improvement of the Illinois river, from the foot of the rapids to the head of Lake Joliet, for steam navigation by means of locks and dams." (Can. Com. Rep., 1900, p. 133.)

DISCUSSION OF HIGH LEVEL FEEDER PROPOSITION.

"The reasons urged by the committee of the House in favor of the first changes proposed are: First, the large sum which the canal will cost upon the present plan; secondly, the length of time required for its completion; third, the difficulties of construction; and fourth, that a better plan can be adopted."

"All of these reasons except the last strike at the root of the project, and have been often urged against the policy of engaging in a work of such magnitude, and it is to be regretted that the committee did not turn its attention more particularly to the last reason, because, unless it can be made to appear that the change proposed by the committee is practicable, the arguments with reference to cost, to time and to difficulties of construction, must have their full weight against proceeding further with the canal." (Can. Com. Rep., 1900, p. 133.)

6406a "If the fact can be established, that a canal much less expensive, equally ample, and securing all the advantages and accommodations which could be obtained from the deep cutting, can be constructed upon the plan proposed by the committee of the House, there will be no ground or point left for disputation. No citizen of Illi-

nois would be found contending against the adoption of such a plan. If, on the contrary, the plan proposed is impracticable, no one desiring the completion of the canal would be willing to abandon the present plan for such reasons as are urged against it." (Can. Com. Rep., 1900, p. 134.)

#### EFFECT OF LOCAL INTERESTS.

"It is a source of deep regret that local and sectional interests of recent origin, should be made to operate upon a question of such vital importance to the character, dignity and faith of the State. A spirit of rivalry is perhaps inseparable from the existence of towns and villages, whose inhabitants imagine that the prosperity of one would be the downfall of the others. Yet whenever such a spirit shall attempt to exert an influence upon legislative action, upon measures involving both State and National policy, it ought to be met by the representatives of the people with the requisite firmness to destroy its influence, and put to shame those who have attempted to use it." (Can. Com. Rep., 1900, p. 134.)

#### SENATE COMMITTEE'S SUMMARY OF FORMER HISTORY (in 1837).

"In the examination of the questions now under consideration, the committee will first review the legislative action bearing upon this point. In 1823 an act was passed organizing a board of commissioners to consider, devise and adopt the measures requisite to effect the communication by canal and locks between the navigable waters of the Illinois river and Lake Michigan. Five distinguished citizens of the State were constituted the board. An examination and survey were executed under their direction by Messrs. Paul and Post, both of whom stood high as men of science, talents and integrity." (Can. Com. Rep., 1900, p. 134.)

"In January, 1829, an act was passed by which a board of canal commissioners was organized, who were required to locate the canal to effect a navigable communication between Lake Michigan and the Illinois river. The canal to be at least 40 feet in width at the summit of the water line, 28 feet wide at the bottom,

and of sufficient depth to contain at least 4 feet of water; and to be furnished with such locks, aqueducts and dams, as might be required to secure a safe and convenient navigation for boats at least 75 feet long, 13½ feet wide and drawing 3 feet of water. No point is fixed in either of those acts for the termination or commencement of the canal; nor was any direction given as to the waters to be used for feeders. (Can. Com. Rep., 1900, p. 134.)

“In 1831 the last act referred to was amended, and an examination was required to be made of the Illinois river, from the mouth of Fox river down to the head of steamboat navigation, with the view of ascertaining whether the Illinois river could be improved by dams and locks, or otherwise, so as to secure its navigation as far upwards as the mouth of Fox river. An examination was also required of the Calumet river to ascertain its probable sufficiency as a feeder for that part of a canal between the Chicago and Des Plaines rivers. In 1832-3, after an ineffectual attempt to change the character of the improvement, from a canal to that of a railway, the board of canal commissioners was abolished, and all further progress of the work suspended. In 1834-5, another act was passed which provided that the canal shall not be less than 45 feet wide at the surface, 30 feet at the base and of sufficient depth to insure a navigation of at least 4 feet, to be suited for ordinary canal boat navigation, to be supplied with water from Lake Michigan and such other sources as the canal commissioners may think proper. No point of termination was fixed by this act. The act of 9th January, 1836, under which the late canal commissioners acted, provides that the canal shall commence at or near the town of Chicago, on canal lands, and shall terminate near the mouth of the Little Vermilion river, in La Salle county, and on land owned by the State. These acts of the Legislature, are referred to, in order to present before the Senate, in one view, the real points in controversy, and to show the reasons upon which the opinion is expressed, that those who propose changes in the action of the Legislature, are bound to show that such changes are practicable, and consistent with proper regard to the interest of the State. It may here be remarked, that an examination of the various laws will

show that the provisions upon the point under consideration *were not adopted by accident and without design*. The committee of the House in order to prove the practicability of the change proposed, have made calculations as to the quantity of water required to supply such a canal as is proposed to be constructed, and at page 19 of their report say: 'You committee feel assured that not only a sufficient quantity of water for all the purposes of the canal can be procured from these two sources (the Calamie and Des Plaines) but that a large surplus will still remain.' (Can. Com. Rep., 1900, p. 134-5.)

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THE SENATE COMMITTEE LEAVE IT TO MR. BUCKLIN.

"No member of your committee having sufficient knowledge of the science of engineering to risk his own judgment upon this question in opposition to the published opinions of gentlemen of acknowledged scientific information, they are compelled to rely upon the opinions of others, in whose judgment they have confidence. Mr. Bucklin, well known to the public, having recently arrived at this place, the chairman of the committee addressed a note to him which together with the reply is as follows": (Can. Com. Rep., 1900, p. 135.)

"Vandalia, Feb. 8, 1837.

Mr. J. M. Bucklin,

SIR:—"I am engaged as chairman of a committee of the Senate, investigating the questions which have recently arisen in regard to the change in the plans in constructing the Illinois and Michigan canal, and particularly the question in relation to the abandonment of the project of supplying the canal with water from the lake, and resorting to the Calamie. Not being an engineer, nor familiar with the calculations in relation to the quantity of water required to supply a canal of the size contemplated, I take the liberty of asking your assistance, and request the favor of you to review the calculations heretofore made by yourself and others in reference to the quantity of water in the Calamie, and to state the quantity required for the canal, as at present proposed to be constructed. You will also state if there is anything peculiar in the character of the coun-



try, to justify the erecting of a canal without providing the usual quantity of water for evaporation and leakage. All the documents, except the report made by you in 1830, will be furnished if desired.

Very respectfully, your obedient servant,

WM. THOMAS,

*Chairman of the Committee on Canals, etc."*

Can. Com. Rep. 1900, p. 135.

The following is Mr. Bucklin's reply:

"Sir:

It will give me great pleasure to afford you any information that I may possess in relation to the interesting subject which you have before you. I can, however, do little more than recapitulate the information that has been derived from various sources respecting it."

"The river Des Plaines was gauged at Laughton's ford, by Messrs. Post and Paul, in the first survey that was ever made of the route of the Illinois and Michigan canal, and the discharge found to be 72 000 cubic feet per hour. They also gauged it at the Calumet land, eighteen miles below, when they ascertained the discharge to be 117,000 cubic feet per hour. In October, 1829, it was gauged by Dr. Howard, U. S. civil engineer, who places the discharge at 96,480 cubic feet per hour. At the same place (Laughton's ford) it was again gauged by Messrs. Harrison & Guion, on the 8th of August, 1830, and found to discharge 60,000 cubic feet per hour. The Calumet river was gauged by me in the month of September, 1830, and found to discharge estimated at 320,000 cubic feet per hour. It was also gauged by M. Guion, assistant civil engineer, in the service of the United States, about the same time, and the discharge placed by him at 1,033,000 cubic feet per hour. It may be proper to remark here that the fall of 1830 was a season of extraordinary drought." (Can. Com. Rep., 1900, p. 135.)

6407a "The allowance of 100 cubic feet per mile per minute for evaporation and filtration was assumed by me as the basis of all calculations in deliberating the minimum quantity of water to be provided for the Illinois and Michigan canal."

"The surface of the canal as at present proposed to be constructed, is sixty feet, and bears the proportion of one and one-half to one to the surface of the canal as

at first proposed. The depth of water is now six feet whereas it was formerly four feet, consequently, the pressure of water being as the squares of the heights, and the leakage nearly as the square roots of the heights, the pressure will be more than doubled and the leakage (taking into calculation the great surface) increased in proportion to one and a half to one.

"The quantity of water then that will be required to supply the evaporation and leakage in a canal of the dimensions proposed, will be 150 cubic feet per minute per mile; and with reference to the peculiar character of the country through which the canal passes, I know of nothing which would justify a departure from the established rule, in regulating the supply of water. It is true the upper level is situated in a very wet country, but the levels below dependent upon the summit for water, are located on ground very badly calculated to retain it, and it is possible that more than the ordinary supply may be required."

"If the project of supplying the canal from Lake Michigan be abandoned, and the high level resorted to, the length of canal including feeders, to be supplied with water on the upper level is fifty-six miles, which will require 8,407 cubic feet per minute to supply the evaporation and leakage, and a further supply of 2,112 for lockage, making in all a minimum supply of 10,512 cubic feet per minute."

Very respectfully, your obedient servant,

J. M. BUCKLIN."

(Can. Com. Rep., 1900, p. 136.)

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#### RIGHTS OF INDIANA IN THE CALUMET.

"Aside from the fact that, according to the most authentic information, the Calumic and Des Plaines do not afford sufficient water for the use of the canal, it is an admitted fact that the Calumic takes its rise in Indiana. From the latest maps it appears to bend through the corner of Illinois and pass into the lake near the State line. It is contended by some that it formerly passed into the lake in Indiana; it is, however, certain that the State of Indiana may use the water of the river to the exclusion of Illinois. The committee are not advised of

any improvement projected by the State of Indiana requiring the use of this river. But the testimony of Lieutenant Burnett herewith submitted, although not conclusive, tends strongly to prove that a company incorporated by the State of Indiana have projected a canal, which will require the use of at least half the water of that stream." (Can. Com. Rep., 1900, p. 136.)

"Upon the point now under consideration the committee have arrived at the following conclusions:"

"First—That the Calamie and Desplaines do not afford sufficient water for the use of the canal."

"Second—That if they did it would not be prudent or safe to rely upon the Calamie."

"In arriving at these conclusions the committee have relied upon the evidence referred to, consisting of extracts from reports, and other authentic documents. It must be evident to all those who have given the subject an examination that the point on the Calamie where it is proposed to take the water, is below the summit of the canal line, and only 2 feet 81-100 above the level of the lake. The erection of a dam across the Calamie would, therefore, be absolutely necessary, the effects and consequences of which cannot with any certainty be calculated or ascertained. One effect would doubtless be the overflowing of an immense tract of country and a subsequent loss of water by evaporation, absorption, etc." (Can. Com. Rep., 1900, p. 136.)

6408 "Your committee will now proceed to the examination of the second and third reasons assigned why a change should be made in the Summit division of the canal, viz.: the length of time required and the difficulties and cost of construction. There are reasons which have often been urged and acted upon by those who have been opposed to the policy of the State's undertaking so stupendous a work; but the judgment of the people has long since been pronounced against their sufficiency. Your committee will not pretend but that there are many difficulties to be encountered in the prosecution of the work and that from five to eight years may be required for its completion. Having arrived at the same conclusion with all others who have examined the subject (*except the committee of the House*) that in order to construct such a canal as the nation has a right to expect, the waters of the lake must be used. The ques-

tion naturally recurs, shall the State persevere in the work, or shall the project be abandoned? These are the real question to be considered, in answering the reasons assigned for the proposed change: and as these questions are general and applicable to the whole line of the work, their consideration will be deferred UNTIL THE SECOND PROPOSITION FOR A CHANGE IS CONSIDERED AND DISPOSED OF."

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**SUBSTANCE OF REPLY. THE NATION HAS PAID WITH A LAND GRANT FOR A CANAL: THEREFORE, WE WILL NOT IMPROVE THE RIVER.**

"The second reason urged, viz.: that the cost of the improvement will be greatly diminished will not be controverted, but the value of that improvement compared with the value of improvement, compared with the value of the canal and the comparative advantages of the two descriptions of improvements, have not been discussed in the report." (Can. Com. Rep., 1900, p. 137.)

"It is a work national in its character, and the people of Illinois should rejoice at the opportunity offered of being instrumental in executing a work of such vast magnitude and importance. The eyes of the civilized world are resting upon us with intense interest, for our success in a work which promises such extensive and incalculable advantages to these United States. The people of the United States are looking to the completion of this work, as forming the last link in an endless chain which shall forever hold these United States in the bonds and pledges of union, and your committee ask in the name of the civilized world, in the name of the people of the United States, and in the name of Illinois, that no local, sectional or private interests be consulted in the decision about to be made." (Can. Com. Rep., 1900, p. 137.)

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**"THE MAGNITUDE OF THE WORK, AND THE DIFFICULTIES ATTENDING ITS EXECUTION HAVE BEEN LONG KNOWN AND CONSIDERED."**

"The representatives of the people did not engage in the work without a due consideration of those difficulties. The interest which the nation has taken in the project

is evinced by the act of Congress changing the northern boundary line of the State by the purchase from the Indians of a strip of territory extending from the Illinois to the lake, with an eye single to this project, by the act of Congress granting right of way to the State, and by the subsequent act granting lands of value sufficient to defray the whole cost of the work." (Can. Com. Rep., 1900, p. 137.)

"It has always been regarded as a national work, and the nation having furnished the means for its execution, have a right to expect the work shall be projected and executed *in a manner suited to the character and views of an united and enlightened people*. The fund for this purpose is admitted on all hands to be ample and no citizen of Illinois ought to be willing to see the faith of the State violated, public expectation disappointed, and the beneficence of the national government abused by authorizing any other description of work." (Can. Com. Rep., 1900, p. 137.)

"The question may be confidently asked—why should any one desire to disappoint the hopes and expectations of the nation in regard to the character of this work? Can it be supposed that the nation would have extended assistance by so large and extensive a grant of lands towards the execution of a project purely local, a project which at best would not accommodate the trade of Illinois alone five years hence." (Can. Com. Rep., 1900, p. 137.)

6408a "To engage in such a project would be sporting with the bounty of the nation and degrading to the character of the State. Who among us would be willing to stand forth before an enlightened, liberal and magnanimous nation and proclaim the sentiment; the nation has furnished us with means to execute a great national work, and although by accepting those means we stand pledged to use them for the purpose intended, yet as a work of a totally different and greatly inferior character, can be executed for one-half the amount furnished, we will make such a work, and vest the other half of those means in bank stock or in improvements of a character purely local. If there be among us any who would be willing to assume such an attitude, and in the face of the world proclaim such a sentiment, it is to be hoped for the honor of the people and dignity of the State, none such can be

found in the walls of the Legislature. Such a sentiment strikes at the very foundation of the public faith, and if acted upon would lead to a total subversion and overthrow of our free institutions. The proposition is too monstrous and involves consequences too disastrous to be entertained for a moment, and your committee will not act upon the presumption, nor indulge the idea that any citizen of Illinois will ever be found giving countenance to such a sentiment. Your committee are satisfied that the canal lands will defray all expenditures required in the construction of the canal, upon the enlarged plan proposed by the canal commissioners, and they hope to see the time when its navigation will be made free to all the people of these United States." (Can. Com. Rep., 1900, p. 138.)

"There should be no question asked in regard to a supply of water from any other source than the lake, so long as it is known that the means furnished by the nation are amply sufficient to execute the work. In the completion of such a project, computations of time should be made with reference to the existence of the Union and not with reference to the growth of a village. If contrary to all calculations eight or fifteen years shall be required for its completion, this would not justify the State or the people in a violation of their plighted faith. The time is not distant when Illinois must stand at the head and in front of all of the western states, and when that time shall arrive, nothing could be a source of greater mortification to her citizens or her sisters than a knowledge that in her infancy she had been guilty of a violation of public faith." (Can. Com. Rep., 1900, p. 138.)

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INTERROGATORIES FROM THE COMMITTEE ON ROADS AND  
CANALS TO THE COMMISSIONERS AND ENGINEERS OF THE  
ILL. & M. CANAL WITH THEIR ANSWERS.

"Question 1st:—What is the fall from Lake Juliet to the present termination of the canal, and what will be the cost of constructing the canal from said lake to its termination on the present plan?"

"Ans. The fall from the head of Lake Juliet to the present termination of the canal is about 75 feet. Cost

of constructing the canal from the head of the Lake to the termination—\$2,213,557.42.” (Can. Com. Rep., 1900, p. 138.)

6409 “Question 20.—What would be the cost of construction of slack water navigation from the foot of the rapids on the Illinois, to the head of the Lake Juliet, taking Mr. Hurd’s estimate as a basis?”

“Ans. To estimate the cost of making slack water navigation of the Illinois River with any accuracy without a survey is impracticable; and to assume Mr. Hurd’s estimate as a basis would show a fair comparison of costs between slack water and the Illinois and Michigan Canal, as now estimated; he having estimated lockage (it is believed at \$1,500 per foot lift and the estimate of lockage on the western division of the canal being \$3,000 per foot lift. Other items will also show a great difference.”

“Q. 29. What quantity of water will the Calamie discharge per hour, allowing the river to be ninety yards wide, average depth eighteen inches, average current two miles per hour?”

“Ans.  $10560 \times 270 \times 1.5 = 4,276,800$  C. feet. (2 miles = 10,560 feet—90 yards = 270 feet, 18 inches = 1.5 feet.) Multiplying the three together, depth, breadth and velocity gives the cubic feet per time unit.” (Can. Com. Rep., 1900, p. 139.)

“Q. 30. What quantity of water do you suppose passes out of the Saganash Swamp and Grassy Lake, also that portion that passes down the Valley of the Stoney Creek as well as that portion of water which empties into the Desplaines River?”

“Ans. In seasons of severe drought, not a drop.” (Can. Com. Rep., 1900, p. 139.)

6410 “During the year 1836 the Canal Commissioners constructed by grading and bridging what was then known as the Saganaskee road, now known as Archer avenue and Archer road, extending from State street, Chicago, to Joliet.” (Can. Com. Rep., 1900, p. 141.)



## FROM ANNUAL REPORT DEC. 13, 1838.

PROGRESS IN CONSTRUCTION CUTTING OFF THE SWAMP ON  
THE SOUTHEAST.

6412 "The line is now under contract from the Chicago River to the termination of LaSalle, with the exception of about 22 miles of shallow cutting between Dresden and Marseilles and some other detached parts, amounting by estimate to \$1,251,103.15, and a mile and a fraction of excavation in the Saganaskee Swamp, which from the peculiar character of the work, as described in the report of the chief engineer, must either be executed in part by agents of the State or wholly deferred until it can be drained through a series of sections below it. To avert the delay incident to the latter course, the first has been adopted, with orders for the immediate preparation of appropriate machinery. Efforts will be made to have everything ready for a commencement by the breaking up of winter. It was once thought that no subdivision of equal length would cost as much or present as many difficulties as the one which stretches through this famous swamp. The semi-final alluvion and vegetable matter of which the swamp is mostly constituted, are not more forbidding in their aspect than they are treacherous in their texture. Hence, for nearly two years it was impracticable at any season by any mode to penetrate it so thoroughly as to ascertain with certainty its true depth and character. The hard freeze of last winter and the low stage of the river and bordering morasses enabled the resident engineer, with a strong party, to traverse and sound every part of them." (Can. Com. Rep., 1900, p. 145.)

"It was found that the Desplaines could be safely turned into its ancient channel below a low island about a mile in length, redeeming by the process some three or four hundred acres of canal land, and securing to the State an important town site, which by any other arrangement, would have fallen on individual property. Convinced of the practicability of turning and dyking the river and that the flood waters of the Saganaskee Valley could be diverted into the Calamie, there was no further hesitation in cancelling the contracts on the

original circuitous route and locating a direct line costing upwards of a hundred and twenty thousand dollars less, and possessing other obvious advantages independent of the town site which at no remote period must be worth a large sum of money. For details, see reports of the principal and resident engineers." (Can. Com. Rep., 1900, p. 145.)

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REFUSAL TO MEASURE THE DESPLAINES IN A GOOD YEAR.

- 6413 "Judge Wright arrived at Chicago in the early part of October, and on the 20th of the same month, Mr. Burnett made a detailed report, with a topographical map and estimates, of the quantities of excavation and other work necessary to effect the object on the most favorable route of the country was susceptible. *At that time and through the whole summer the Desplaines River was generally admitted to be unusually flush*, as was also the Calamic. No gauges were therefore ordered, and consequently those of the Desplaines made by the United States engineers in 1830, and of the Calamic by Mr. Bucklin, were adopted as the basis of the investigation."  
\* \* \* (Can. Com. Rep., 1900, p. 147.)

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"GAUGING IT IN THE DRY SEASON."

"The past dry season rendered the measuring of the Desplaines almost unnecessary, since for nearly four months the tightest dam that could be erected would not, at the point for taking out a feeder, have saved water enough to propel a single pair of ordinary mill-stones. Repeated gaugings from the 20th of July to the 22d of August and it was afterwards still lower, *gave an average* of less than the measurement of 1830." (Can. Com. Rep., 1900, p. 147.)

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SWAMPS AND BLUFFS.

- 6413a "The fifteen sections extending from the Chicago River to the 'Point of Oaks,' eight miles and lying through the low wet prairie periodically flooded by the Desplaines River through Mud Lake, have been com-

pletely defended against any possible danger from surface water; and are now, by means of those defenses, accessible and tenable at any season of the year. The same plan of drainage and defense is gradually progressing from the 'Point of Oaks' to the Sanagaskee Swamp, and enough has been done to inspire the fullest confidence in the practicability and moderate cost of the work." (Can. Com. Rep., 1900, p. 148.)

"The costly and exposed sections around the base of the Kankakee bluffs are in the hands of experienced contractors, who are known to have executed extensive and more difficult jobs on the St. Lawrence Canal. The safety of the plan of construction is now generally conceded, and the price at which the work was taken was fair. From this point to Marseilles nothing has been let; thence to Ottawa the work is advancing steadily and will be finished in good time." (Can. Com. Rep., 1900, p. 148.)

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#### COST OF CONSTRUCTION—VALUE OF LANDS EQUAL TO COST.

- 6415 "It appears from the estimates of the chief engineer as will be seen by an examination of his report that according to the contracts made, adding a full allowance for the light sections not under contract, the sum of \$7,621,442.57 will cover, with very little variation, every expense for a convenient, substantial and elegant canal, such as it ought to be for commercial economy, durability and State character. The original estimate of the same engineer, exclusive of the additions at Ottawa and the enlargement of the basin in Chicago, was \$8,654,337.51, being \$1,032,894.94 more than will be required to complete the work." (Can. Com. Rep., 1900, p. 151.)
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#### FROM CHIEF ENGINEER GOODING'S REPORT DEC. 10, 1838. PROTECTION FROM OVERFLOW OF DESPLAINES.

"In conclusion, the Commissioners reiterate the opinion, expressed in the first annual report to the Governor, that 'if these lands and town lots be very gradually and cautiously brought into market, reserving the chief part until the canal shall have been completed, and all its ad-

vantages clearly understood, there is more than enough to build it on the present capacious and permanent plan. But, on the contrary, if sales be forced and all the lands be disposed of before their true value be known, there cannot fail to be a deficit of several millions of dollars. Many tracts of land that would not bring more than five or six dollars per acre if sold immediately may be worth a few years hence, from twenty to one hundred dollars. Innumerable instances of the kind might be adduced, some of them in the vicinity of the canal."

"All of which is respectfully submitted.

W. F. THORNTON,  
*Late President.*  
JACOB FRY,  
*Acting Commissioner.*

(Can. Com. Rep., 1900, p. 152.)

6415a "The part of the line from the south branch of the Chicago River to summit or the Point of Oaks is now placed in such a situation as to insure its safety from the high water caused by the overflowing of the Desplaines River."

"This has hitherto been the cause of much trouble and delay, and occasioned for a considerable length of time, an entire suspension of the work. A small part of the deep earth cutting in the valley of the Desplaines, between Summit and the Saganaskee, has also been protected, so that the work may be successfully prosecuted during the seasons of high water." (Can. Com. Rep., 1900, p. 152.)

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#### USE OF RIVER CHANNEL.

"The location of the canal at the Saganaskee Swamp and the plan of constructing it have materially changed since my first estimate was made, and a very decided advantage gained in the expense, in the symmetry of the line, and in the increase value of State property. The canal as now located occupies as much of the channel of the river as can be made available upon a straight line. A new channel for the river will be opened on the west side of a low island or peninsula which extends the whole length of Sections 42, 43 and 44, and will occupy

nearly the same place where the main channel of the river appears once to have been. An embankment will be made connected with the spoil bank on the west side of the canal at the lower end of Section No. 41 (which is just above the Sag and near the present channel of the river) crossing the river from that point to the island, and running thence across the island to a bayou, which will form a part of the new channel; thence parallel with the canal and about twenty-two chains from it, upon the west side of said island to a point near the lower end of it; and thence across the canal upon Section No. 45, where it will be connected with the protection so as to exclude the waters of the river. Parallel with and near the embankment upon the west side of the island, the artificial channel will be made so as to unite the bayou above mentioned with one that extends up from the lower end of the island." (Can. Com. Rep., 1900, p. 152.)

6416 "This channel will be opened 200 feet and all the earth excavation from it deposited upon the island side. It is believed that the depth of excavation sufficient only to remove the roots will be all that will be necessary; for the whole river being forced into the channel by the embankment above described, will cause a current sufficiently strong in time of floods to deepen and enlarge it to the requisite dimensions. There is a large, deep basin, or expansion of the river below the channel of sufficient capacity to hold all the deposit that can be washed into it." (Can. Com. Rep., 1900, p. 153.)

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#### A SEASON OF SEVERE DROUGHT.

6416a "The value of the water power created here and at other points upon the canal, by drawing a supply of water directly from Lake Michigan, can be fully appreciated after a season of *such severe drought as the past*. The Desplaines River and many other considerable streams of the country have been nearly dried up, and probably three-fourths of the water-mills throughout a large portion of the United States have been standing still for the *last three months*." (Can. Com. Rep., 1900, p. 154.)

## LOCATION OF BASIN AND DAMS NOS. 1 AND 2.

6417 "Lock number 4 brings the canal to the level formed by the pool of dam number 1. A short distance below said lock, the line runs into the channel of the Desplaines River, which will here be turned to the right and the whole of the water forced into the channel upon the west side of Norman's Island." (Can. Com. Rep., 1900, p. 155.)

"The rock excavation in the bed of the river, from the point where the canal enters it to the upper end of said island, averages about two and a half feet in depth; but when the river is turned the excavation will be attended with no particular difficulty. The excavation continues across the island running out at the lower end of it, where the towing path crosses the river, and is thence continued down the right bank to the guard lock at dam number 2, where the independent canal again commences. From this point to the termination of the canal, the towing path is upon the left or south side." (Can. Com. Rep., 1900, p. 155.)

"From Norman's Island to dam number 1, which is located upon canal land, just above the town of Juliet, two strong walls with embankments between them, will be constructed upon the east side to confine the water in the pool of the dam. It is proposed to raise these walls and embankments 7 feet above the comb of the dam, to be perfectly secure from the highest floods. From dam number 1, to dam number 2, a similar defense will be required, but of a much less height." (Can. Com. Rep., 1900, p. 155.)

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DUPAGE FEEDER.

"A feeder will be taken into the canal from the Du Page about three miles above the crossing. The last season has shown this stream to be one of the most permanent in the State, and it can be introduced as a feeder at a very moderate expense." (Can. Com. Rep., 1900, p. 155.)

## SLOPE OF WALL AT DRESDEN.

6417a "From the Du Page to Dresden the line has been but slightly changed since the first survey, but the quantity of slope wall to protect the canal at the Kankakee bluffs has been considerably increased to render the canal doubly secure at this exposed point." (Can. Com. Rep., 1900, p. 156.)

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FROM CHIEF ENGINEER GOODING'S SUPPLEMENTAL REPORT  
OF DECEMBER, 1838.

6419a

## PROGRESS OF WORK.

"The number of laborers engaged upon the canal on the first of December last was not far from 350, and the force was not much augmented till the opening of spring navigation. There are now actually employed upon the canal, and in the various operations immediately connected with canal construction, about 1,700 men." (Can. Com. Rep., 1900, pp. 160-161.)

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## "HIGH WATER IN DESPLAINES—THE STATE SIDE DITCH.

6420

"The streams for a great part of the year have been *very high, particularly the Desplaines River*; but less interruption to the execution of the work has resulted from this cause than might have been anticipated from the unprotected state of most of the sections; and it has been clearly shown that a defense can be made at a moderate expense, that will render the whole work perfectly secure during the highest floods. The high water in the Illinois River has been the cause of serious delay in the excavation of the steamboat basin and channel at the termination, and a large force will be requisite upon the work as soon as a favorable season for operations shall be presented." (Can. Com. Rep., 1900, p. 161.)

"Considerable progress has been made in the deep earth excavation between the Chicago River and the Point of Oaks, but there has been so much water upon the surface since the work was let that the side ditch, which is to be formed on the south side of the canal without the spoil-bank, has not yet been finished, nor but



a small part on the bank on the north side, which is to guard against the water that flows from the Desplaines River in time of floods, and which is to be formed of earth excavated from a ditch within the prism of canal." (Can. Com. Rep., 1900, p. 161.)

- 6421 "During the past year ditches have been laid out, placed under contract and partly executed from the Point of Oaks to Chicago River, and from the mouth of Saganaskee swamp to Big run; the object of which is to receive and carry off the water which must otherwise drain into the canal, or accumulate behind the spoil-banks. By the aid of these ditches, the water (except what falls behind the spoil-banks) may be effectually prevented from conveying deposit into the canal, and also from interrupting the progress of the work during the construction." (Can. Com. Rep., 1900, p. 163.)

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FROM RESIDENT ENGINEER TALCOTT'S REPORT OF DEC. 10, 1838.

"CANAL OVERFLOWED BY RIVER—DITCH TO CUT OFF THE DRAINAGE.

- 6422 "Upon resuming charge of the line in March, 1837, I found nearly every section, one to fifteen, inclusive, was the second time offered for contract in May, 1837. The unfavorable appearance of the work (nearly one-half of which was *overflowed by the river*) prevented much competition, and the proposals received were considered much above the real value of the work. Sections one, two and three only were awarded. The commissioners then determined to defend the work by a continuous embankment on the north side formed by excavation from the prism of the canal, and on the south by a *ditch* without the spoil-bank *to receive the drainage of the country* which is discharged into the southernmost branch of Chicago River." (Can. Com. Rep., 1900, p. 165.)

"The season was far advanced before much progress had been made, and the imperfect protection proved no defense against the unusual high water in December, 1837. Nearly every section that had been commenced was overflowed and the work generally suspended during the winter." (Can. Com. Rep., 1900, p. 166.)

## USE OF RIVER BED.

- 6422a "That part of the line opposite to the Saganaskee valley was examined with reference to adopting the present channel and changing the river to what appears to have been its former channel on the west side of a peninsula island. These examinations were made at a high stage of water, which rendered it difficult to make them with the desirable precision. The data presented, however, were considered sufficient to determine the location by avoiding the river, yet approaching it somewhat nearer than the original line, and improving its general direction." (Can. Com. Rep., 1900, p. 166.)
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## DRAINAGE RESERVOIRS.

- 6423 "Between the Point of Oaks and the Saganaskee Valley, there will be required four receiving reservoirs for the drainage of the country. These will consist of a pit formed in the rear of the spoil bank, about thirty feet square excavated to two feet below top-water line of canal, with the sides and bottom paved, and communicating with the canal by a narrow passage. It is believed that these will receive the deposit usually carried into a canal by the drainage water—forming bars expensive to remove, and frequently proving a serious embarrassment in the navigation." (Can. Com. Rep., 1900, p. 167.)
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## "PROGRESS OF WORK—OVERFLOW BY RIVER.

- 6423a "When the amount of work performed during the two past years is contrasted with the expectations then formed by many of its friends, some may feel disappointed, yet, when it is considered that the season of 1837 was unusually wet; that nearly every section that had been commenced was *overflowed by the river* and the work necessarily suspended until the ensuing spring; the sickness that has prevailed through the past season; that the work is now generally secure against the surface water; and that cranes and railroads are now successfully employed for removing the rock on nearly every section—it must be admitted that much has been

done under the circumstances, and that the work presents a truly flattering prospect for its rapid progress in future." (Can. Com. Rep., 1900, p. 168.)

#### PIVOT BRIDGES.

- 6424 "Believing that it would be found advantageous to the commerce of the country for the lake vessels to navigate the canal *as far as Lockport* turning or pivot bridges have been estimated." (Can. Com. Rep., 1900, p. 168.)

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FROM RESIDENT ENGINEER WM. JEROME'S REPORT, 1838.  
JOLIET BASIN—MOUTH OF RIVER—LOCATION OF CANAL  
RIVER WALLS.

"For three-fourths of a mile above and nearly through Juliet, the canal occupies the bed of the Desplaines River and is of increased width. The banks for this distance *are to be raised some feet above the ordinary height*, and to be protected from the wash of the floods by substantial walls on the inner sides."

"The river is to be raised to the requisite height by two stone dams at Juliet. With the upper dam is connected lock number 5, of ten feet lift, with a guard of four feet, making a valuable water power on canal land. With the lower dam is connected a guard lock; at which point the canal leaves the river."

"Owing to the height of the spring floods, it became apparent that the line from Juliet to and over the Du Page River would be benefited by being located on a higher level than the former, of some five or six feet. This location varies the line considerably from the original, although, taking the whole distance, the cost of construction is not materially changed; and it is believed that a better location has been obtained. By this means the Du Page River is passed by an aqueduct sufficiently elevated above the highest floods to secure its permanency."

"About three miles above the aqueduct, the Du Page is to be received into the canal by a side cut of twenty chains in length, connected with a dam across said river."

"There is to be guard bank extending from the dam

up the east side of the river twenty-six chains. This bank is deemed necessary to prevent serious injury which would otherwise accrue to the canal at this point, from the high floods. Immediately below the aqueduct, are located locks number 6 and 7, with an aggregate lift of fifteen and a half feet. From thence to Dresden, a distance of five miles, the line occupies nearly the ground of the original location. The greater portion of this distance, the canal passes at the foot of the Kankakee bluffs; some part of the way *in the edge of the Des-*  
 6424a *plaines and Illinois Rivers*—the towing path bank to be protected from the great floods and extensive ice jams formed by the uniting of the waters of the Desplaines and Kankakee Rivers, *by a strong wall on the river side.*" (Can. Com. Rep., 1900, pp. 169-170.)

### 1837. DEEP CUT OR SHALLOW CUT.

FROM CONSULTING ENGINEER WRIGHT'S REPORT, OCT. 23,

6426a "From an examination of the various canal documents of the last session of the Legislature, it seems that the question stands as follows:

'Shall the feeding water be taken from Lake Michigan by a deep cut? or, shall the summit be raised ten feet above the lake, and fed from streams to be brought into it? It has been supposed, and no doubt correctly, that only three streams of water can be brought on the Summit level: First, the Desplaines River, second, the Calumet River; third, the Fox River.'

'The Desplaines was not in a proper situation to gauge, *as there had been copious rains*; I therefore take the former measurements of the United States engineers, as stated in the reports of the canal committee, at 54,800 cubic feet per hour.'

'By calculation it is found that, if twelve boats pass per hour, the lockage water to lock up and down ten feet will be 475,500 feet per hour. If we then add for leakage at the locks (a small item) and for evaporation, we ought not to say less than 500,000 cubic feet of water per hour will be required, when boats are passing as fast as they can be let through (or twelve per hour). It is true that, if boats passing each way were to meet so as to pass a boat up with the same water which passed one down, then only half the amount of lockage water

should be estimated for the twelve boats per hour, although, I believe twelve boats per hour may be passed each way, if the locks are well attended, and are in perfect order for filling and discharging the water rapidly.'

'These premises being admitted, we have to look for 445,200 cubic feet of water per hour more than the Desplaines gives us at low water.' (Can. Com. Rep., 1900, p. 174.)

6427 "Taking a view of the whole ground, and looking at the probable cost of the deep cutting, of the low level, and the length of time it will take to accomplish it, and the time the country will lose the benefit; looking also at the great good to the country, and the pecuniary advantage to the State and the canal, by the creation of water power at Lockport, and Juliet, I have no doubt upon my mind that the present plan of cutting down the Summit, so as to draw feeding water from Lake Michigan, ought to be continued, in preference to any other which I can suggest." (Can. Com. Rep., 1900, pp. 175-176.)

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USE OF DESPLAINES AS SUMMIT FEEDER SIDE DITCH TO CUT OFF DRAINAGE.

6429a "I would not fill the summit level with the water from the Chicago but let it fill slowly from other streams before I broke this bar of earth; this can be removed by a dredger."

"4th. Is the present plant of drainage a judicious one, and what difficulty may be anticipated from water in excavating the Summit?"

"The greatest difficulty in working this division is the water, beginning at Chicago River, and from thence to the end of Section 15. If I have understood the plan of the chief engineer, it is his intention to have a large ditch outside of the spoil-bank, on the upper or southeast side, and this to be extended as now partly done, to the south branch of the Chicago."

"It may perhaps be found that some of the sections near the Point of Oaks do not drain freely by this ditch; if so, then they must be drained across the canal. A guard bank of earth must be raised along the north side to keep out the water from the Desplaines River and from the prairie. These precautions will keep out sur-

face water, which is nearly all they have to contend with on this part. From the Point of Oaks, on Section 15 to 45, is the most difficult part to drain." (Can. Com. Rep., 1900, p. 180.)

- 6430 "But in order to drain this part, from 15 to 45 effectually, a very large drain nearly or quite the size of a forty-foot canal, should be cut from Section 42 or 43, and extend eastward through the whole Saganaskee swamp to Stony Creek. This must be cut three feet at the canal and  $8\frac{1}{2}$  feet at the summit of the swamp, 5 miles east of the canal, and then continue 7 or 8 miles further before it will find a free discharge; the water having so far to run must have a large bed, as there will be a great collection of water in heavy rain." (Can. Com. Rep., 1900, p. 181.)
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6433 DAMAGE FROM A SUSPENSION OF THE CANAL DEC., 1839.

(Consequent upon the Financial Depression of 1837-8.)  
Considered pp. 185-189.

COST OF THE WORK AND VALUE OF LANDS.

From Commissioners' Report of Dec. 21, 1840. (Can. Com. Rep., 1900, p. 187.)

- 6433a "The lands, towns, water power, coal mines and stone quarries must bring their improved worth or they will not be sufficient to pay the current interest and discharge any considerable portion of the debts. On this subject the board remain firm in the opinion expressed in their first annual report and repeated in several others, that, 'if these lands and town lots be gradually and cautiously brought into market, reserving the chief part until the canal shall have been completed and all its advantages clearly understood, there is enough to build it on its present capacious and permanent plan. But on the contrary, if sales be forced before their true value be known, there cannot fail to be a deficit of several millions.'" (Can. Com. Rep., 1900, p. 188.)
- 6434a (Can. Com. Rep., 1900, p. 190.)

LEGISLATIVE COMMITTEE'S REPORT. (1840-1.) SUMMARY  
OF HISTORY—RECOMMENDS COMPLETION.

"By an Act of Congress of March 30, 1832, the state was authorized to construct the canal over the public lands and ninety feet of land was given on each side of the canal to the state. The canal was to be begun in three and completed in twelve years. The act gave the state the right to use any materials upon Government lands, necessary to complete the work. Another act was passed March 2, 1827, which granted to the state a quantity of land equal to one-half of five sections, on each side of the canal, and reserving each alternate section to the United States. Another act of Congress was passed March 2, 1833, granting to the state the right to construct a railroad in the place of a canal, and extending the time to complete either to five years. In consequence of this grant the legislature of Illinois appointed, at the session of 1822 and '23, a board of Canal Commissioners who made an examination and an estimate of the probable cost of the work. This estimate cost, which was only made from a surface survey, without ascertaining the amount of rock excavation, fell a little short of \$800,000. The survey cost the state over \$10,000. At the same session, a company, with a capital not exceeding one million, was chartered, to complete the canal, which was to be constructed and owned by the company for fifty years—after which the state had a right to purchase it, by paying the cost of construction and six per cent. per annum; but in 1826, this act was repealed.

In 1829, a new board was organized, with power to make further surveys and begin the work. And by a further act of 1831, the commissioners were authorized to lay out towns, and did proceed to lay off and sell lots in Chicago and Ottawa, and sell lands along the route. They also reported separate statements of the cost of constructing a canal and a railroad between Lake Michigan and the Illinois river. By estimates of the first work they reported it cost at \$4,043,086.50 and that of a railroad \$1,052,488.19. At the next session the legislature abolished the office of canal commissioner, after these efforts had cost the state \$16,972.83. Again at the ses-



sion of 1834 and '35, Mr. Forquer, the chairman of the Committee on Internal Improvements, considering the importance of this subject (which had been referred to in the Governor's message), and with the feeling of a patriot and the views of an enlightened statesman, again brought this question, by his report, to the consideration of the Senate, and to every citizen who felt the great importance of this enterprise to the present and future prosperity of our state.

The people of Illinois had, in this manner, and by the sale of the canal lands and the beginning of the work, so far accepted the grant of the General Government, and had duly considered and determined whether they would yield this grant of land to any company, or undertake the canal on the faith and credit of the state.

The lucid report of Mr. Forquer, of 1835, induced another enactment of the legislature which seemed conclusively to fix the settled policy which the state had determined to pursue, on the acceptance of this grant from the United States, and the manner in which the work was to be commenced and completed—that is, on the sole responsibility of the state. But owing to the imperfection of the act of 1835, the Governor was not entitled to borrow the money necessary to begin the work.

6435 Again in 1836 the people, impressed with the magnitude and value of this work to the growth of our infant but fast settling state, asked the legislature to pass another law, empowering the Governor to negotiate a loan on the sole faith of the state. This last act created another board of canal commissioners, who commenced new surveys and estimates preparatory to renewed exertion to its completion. Contracts were let, and labor performed to the amount of \$35,744.83. In this year the commissioners laid off town lots, at Chicago and sold them to the amount of over \$1,000,000 with a common understanding that the canal was to be completed. The action of the legislature thus far, and in 1836 especially, had furnished to citizens of sister states and to foreigners, sure reasons for emigration here, and the inducing and powerful motives for the investment of their capital. • • •

Again in 1837, the legislature, coming afresh from

their constituents, after the work was begun, and impressed with its importance, passed an amendatory act of 1836, to aid in its completion. This year there was expended on the canal \$356,899.43. The commissioners also sold additional town lots and lands, to assist in paying off the canal debt. These lots and lands, also were sold, as the others had been, with the common understanding that this enterprise was not to languish or fail, by our neglect to put in requisition the available means, so ample, and which had been looked to ultimately, for the final completion of this work. The close relation then, which exists between this long contemplated improvement and the lasting interests of our citizens, and so universally acknowledged and by few questioned, induces the committee, with the more confidence, to ask its final completion."

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#### CANAL VS. RAILROADS.

"The committee will not dwell longer on this branch of the subject but will hasten to answer a question which has been recently made by some gentlemen of standing, in and out of the legislature, 'whether it would not be the part of wisdom now to abandon this canal and construct a railroad along the route?' The committee are not insensible to the benefits arising to the country from the completion of well planned railroads. But they have no difficulty in coming to a conclusion to prefer canals over railroads." (Can. Com. Rep., 1900, p. 191.)

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Gov. Ford's MESSAGE DEC. 8, 1842.

#### RECOMMENDS COMPLETION.

##### RECOMMENDS CHANGE TO HIGH LEVEL—SHALLOW CUT.

6437a "The canal lands and lots and other property belonging to it, stand upon a different footing. This property was first given to the state in trust to make the canal. It was afterwards appropriated by the General Assembly to that specific object, and solemnly pledged to creditors for the payment of money heretofore borrowed, and which money has been used in the construction of

the canal so far as it has proceeded. Those creditors, therefore, have such a separate and exclusive right to its avails as would not without their consent justify throwing it into an aggregate fund for a general payment of debt. If they should require it we would be bound in duty and honor to surrender it to them. It is, however, believed that no such requisition will be made. They understand their true interest too well; they know as well as ourselves the importance and profitable character of this great work, and would prefer looking to its probable completion rather than an immediate sacrifice of the means of carrying it on, for ultimate payment. They must, and do understand, that if this property should be sacrificed, the state will have no means or payment for a long time to come; whereas, if the canal progresses, to completion, the lands and lots and water power will be quadrupled in value, and the tolls alone would in a short time pay interest on all the debt contracted for its construction." (Can. Com. Rep., 1900, p. 196.)

6438 "The sum of four million eight hundred thousand dollars, or thereabouts, has already been expended on this work in its construction, and in the payment of interest; seven hundred and fifty thousand, five hundred and thirty dollars and forty-two cents, of which has been raised by a sale of lands, lots, timber and stone; 10,580 acres of land were sold in 1830 for \$14,204.87; also at the same time 126 lots in Chicago and 9 lots in Ottawa were sold for \$4,594. Since 1836, 40,295 acres have been sold for \$302,248.40; and about 189 lots in La Salle, Ottawa and Lockport for \$77,793; stone and timber to the amount of \$9,659.00 and sales were made in Chicago and Ottawa in 1836 for which cash has been received to the amount of \$544,074.97; and there is now due the canal fund on account of sales, the sum of \$207,682.53.

In addition to this balance, the property belonging to the canal fund is as follows: Two hundred and thirty thousand, four hundred and sixty-seven acres of land, 370 lots in Chicago, 679 in Lockport, 914 in Ottawa, 1,528 in La Salle, other town property to be laid out at Juliet, Du Page and other places; and the water power on the entire line of the canal; the whole, valued by the

Acting Canal Commissioner, from whom these statistics were derived, at the sum of \$5,050,000.00. It is, however, due to the subject to state, that this valuation is predicated upon the hypothesis that the canal is to be completed, or insure prospects thereof.

I therefore, respectfully recommend to the General Assembly, that the further measures to be adopted for the prosecution of the work should be upon the *plan of a moderate sized high level canal*. I am fully sensible of the great responsibility assumed by me, in making this recommendation, nothing but a full conviction of our inability to proceed with the enlarged work would justify a *change of plan after it has progressed so far as it has*. But, in view of our present and prospective want of credit and resources, it does seem that the enlarged work is not to be achieved by any means now in our power; and, indeed, it does seem that we are to choose between reduction and no canal of any description." (Can. Com. Rep., 1900, p. 197.)

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LEGISLATIVE REPORT—1842; THE MORTGAGE TO CANAL TRUSTEES PROPOSED.

6438a "After careful investigation and close examination of the various plans and suggestions for carrying on the canal the committee have come to the conclusion that there is but one plan which, at the present time, appears practical and worthy of consideration; they have come to this conclusion from an examination of different letters and plans from the most distinguished citizens and capitalists in the City of New York and also from London. The views given in the letters and plans referred to are judicious, sound and practical, and if carried into effect would undoubtedly secure the completion of the canal and the ultimate payment of the whole debt of the state. \* \* \*

If we attempted to rear a structure of too gigantic proportions, one which fell of its own cumbrous weight, it does not become us to spend our time in vain regrets and grieve in idleness over our disappointments, but let us gather what yet remains uninjured from the ruins and erect a fabric more proportionate to our means.

The proposition for carrying on the canal made by many of the creditors of the state, is as follows:

First, the state to convey all the canal lands, town lots, water power, coal beds, stone quarries, and all the canal property, together with all the tolls that may be derived from transportation upon the canal to trustees, who shall hold the aforesaid property in trust for the canal bondholders. The aforesaid trustees to be appointed as follows: Two on the part of the creditors and one on the part of the state. The canal bondholders are to subscribe a sum sufficient to complete the canal to be disbursed by the trustees in the construction of the canal. The trustees to have all the power given to the Canal Commissioners. After the canal shall be completed the trustees are to proceed to sell the canal property from time to time as the demand may require. All receipts of moneys are to be paid, first, to reimburse the subscribers for the new advance, and second to pay the bonds they now hold against the state. Those bondholders subscribing to have a preference over all others, and those refusing to subscribe to be paid last. After the creditors, who may advance the required means, are paid the amount of subscription and the bonds they now hold, the duties of the Board of Trustees shall cease, and the state again to have the entire control of the canal and its property." \* \* \* (Can. Com. Rep., 1900, p. 198.)

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FROM SENATE REPORT DEC. 14, 1842. PROPOSES ASKING  
NATIONAL AID.

6439a "That in consequence of the present embarrassed condition of the canal the total suspension of the work and the utter inability of the state to afford any aid, they deem it right and proper to ask Congress further aid in *carrying on and completing this great and noble improvement*. Your committee would respectfully suggest the propriety of so framing the memorial as to place the requisition upon the ground of this canal being a national work, and that it was in consequence of the donation from the General Government that the state was induced to commence this gigantic undertaking, under the belief that the appropriation of land was

sufficient to complete it. That the donation was based upon the estimates of the United States engineers, and that time and further developments have shown that their estimates covered but a small part of the real cost of this canal. That they believe it was the intention of Congress to have the donation cover the cost of the work, and that now, the state having become involved and unable to progress with it, Congress are in honor bound to render further aid." (Can. Com. Rep., 1900, p. 200.)

FROM ENGINEER GOODING'S REPORT DEC. 1842.

6440 "The cost of the canal may now be represented as follows, to-wit:

The amount of work which has been completed and that which is now under contract .....	\$6,751,006.21
The amount of work not under contract....	906,665.11
For superintendence and contingencies....	350,000.00

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Total cost of the canal.....\$8,007,661.32

(Can. Com. Rep., 1900, p. 201.)

6440a (Can. Com. Rep., 1900, p. 202.)

The total amount of work done is.....	\$4,699,492.03
Cost of superintendence and contingencies properly chargeable to construction, account to this time about.....	210,000.00

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Total expense incurred.....\$4,909,492.03

Total amount remaining to be done.... 3,098,169.29

Of the amount to be done \$2,958,169.29 is for unfinished work, and the balance (\$140,000) for superintendence and contingencies.

From the time the Illinois and Michigan Canal was first projected there seems to have been a difference of opinion amongst its friends in relation to the proper size of the work and plan of its construction. As this difference of opinion still prevails, in order, in some measure to account for it, it may not be improper to allude to the different surveys which have been made, and the different opinions entertained and expressed by those who made or directed them, in relation to this great work.

The first survey was made in the autumn of 1824, by Colonel's Post and Paul, under the direction of Messrs. Sloo, Brown, West and Smith, Canal Commissioners. An examination of the reports of these gentlemen will show that notwithstanding their ability, their survey and estimates did not give a correct idea of the obstacles to be overcome in the construction of the canal. In fact, the little that was known of the country previous to the commencement of the examinations, and the very imperfect knowledge which the best informed in this country at that time had in relation to public works of this character, rendered it almost impossible that they should have formed very correct opinions of the magnitude of the undertaking. But low as were their estimates, it is obvious they were higher than the public expected; for the Commissioners, after giving the estimates of the engineers, remark, that 'these estimates, it is true, exceed considerably the general expectation, and the Commissioners are too well aware of the financial embarrassments of the state, at present, to indulge a well founded hope that immediate measures can be adopted for executing a work of so much importance.

The estimates of the five different routes marked out, were as follows, to-wit:

First route is estimated at.....	\$716,110.71
Second route is estimated at.....	639,542.78
Third route is estimated at.....	668,289.68
Fourth route is estimated at.....	682,610.20
Fifth route is estimated at.....	689,746.96

On the fourth route the supply of water was to be drawn in part from Lake Michigan and on the fifth, entirely from this source; though upon both plans or routes the deep cut of our present plan must have been encountered.

The canal, as estimated above, would have been two feet in depth, and twenty in width, less than our present canal.

The gauges of the different streams from which a supply of water would have been drawn, are given as follows, to-wit:

Desplaines river at Cache Island..	117,000 feet per hour.
DuPage " " "	..114,000 " "
Aux Sable " " "	.. 60,000 " "
Fox " " "	..450,000 " "



The engineers remark in relation to these gauges that the 'results are predicated upon the present stage of water,' and that the quantities may sometimes be lower.

From the foregoing extracts it is plain that no difficulty was anticipated in relation to a cheap supply of water for the canal. If the streams on the route would not afford sufficient water, it would cost no more to procure a never-failing supply from Lake Michigan than from these sources.

6441 The surveys of the canal route by the United States engineers in 1830 and in 1831, seem to have been made more to ascertain the practicability of the work and the general character of the route, than with a view to obtain data for a particular estimate of cost. In fact, I believe that no estimate of the cost of the work was submitted until the summer of 1834, at least I have never seen one of an earlier date. Gen. Gratiot submitted his estimate in June, 1834, of the cost of constructing a steamboat canal from Chicago to the mouth of the Little Vermilion river. The dimensions were as follows, to-wit:

For the first twenty-seven miles from the lake, *or to the running out of the lake level, the canal, except two miles, is one hundred feet wide and ten feet deep.* The remaining two miles to be distributed in short sections at convenient distances, *'to be two hundred feet wide; to accommodate boats while detained in changing cargoes without interruption to the navigation.'* The remaining distance of sixty-five miles *'to be not less than one hundred feet at the surface and six feet deep.'* The total cost of this canal was estimated at \$4,299,439.81.

The contest in the winter of 1836-7 closed by the passage of a law authorizing the Canal Commissioners to prosecute the work upon the present plan, but requiring them to procure a skillful engineer from abroad to examine and report whether 'a supply of water from sources within the legitimate authority of the State of Illinois,' could be procured without resorting to the lake, *or in other words, whether a shallow cut, or high level canal could be supplied with water,* and if so, whether enough could be gained to make it for the interest of the state to change the plan which had already been adopted by law, after a considerable portion of the work had been placed under contract.

Judge Wright was the eminent engineer whose services were secured by the Commissioners, and the substance of his report upon this subject is well known to the public. From the time his report was published until the work was nearly suspended on account of the financial embarrassments of the state, little was said about a change of plan. It was supposed that there was nearly or quite canal property enough to complete it upon the deep cut plan, and so long as the state could procure the money to carry on the work, little solicitude was felt as to the plan, though it was still believed by many that it should have been changed, or that the high level should have been adopted at the outset.

It never having been made a part of my duty to investigate this subject I have hitherto deemed it improper to allude to it in my reports, but at this important crisis in the affairs of the canal, when the work is nearly suspended, the state credit gone, our citizens discouraged, and no hopes entertained of brighter prospects until the completion of this important improvement is rendered certain, I shall present a few facts and conclusions which I believe may be of some public utility, and which certainly can do no injury to the best interests of the canal.

The length of the canal from Chicago river, or the waters of Lake Michigan to Marseilles is seventy-four miles. The demand for water upon this line, assuming the usual data (as far as adapted to the present work), adopted by experienced engineers in other states, and obtained by actual experiments on several different canals, may be calculated as follows, to-wit:

From Section No. 1 to Section 64 inclusive, for evaporation and leakage at lock gates, there being no loss by filtration.....	400	cubic per min.
From Sec. 64 to Marseilles, 47 miles, at 150 cubic feet mile.....	7,050	" " "
Lockage water for locks at each end of the line, on plan of the high level .....	2,174	" " "

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Total demand .....9,924 cubic per min.  
(Can. Com. Rep., 1900, p. 203.)

6441a I have calculated no loss by filtration from Chicago river to Section 64, because I have supposed that the canal upon the high level will be sunk so low that the surface of the water, in all cases, will be below the natural surface of the ground and on a level, for most of the distance, as low as the surface of the Desplaines river. The soil, too, and the rock through which the excavations are made, are of such a character that no danger need be apprehended that any water will leak out or be absorbed on this portion of the work. The evaporation is in reality, almost too small an item to be taken into the account at all, but it is mentioned because it is usually estimated in computing the demand for water upon canals.

But the evaporation upon the whole of our canal, calculating the length at ninety-six miles, *and the width at sixty feet* would be but 264 cubic feet per minute, estimating the evaporation during a season of navigation of 240 days to be three feet (which is about the average annual evaporation in this country), or it would be less than three cubic feet per minute per mile.

The leakage at the lock gates will be but a small item, if the work be properly executed and the allowance made is undoubtedly sufficient.

In calculating the amount of lockage water necessary, I have estimated water sufficient to fill the locks (one of eight and one of ten feet lift) *one hundred times in every twenty-four hours*. But it is not probable that this amount of water will be necessary for the *passage of 100 boats*. As nearly an equal number of boats must pass each way during the season of navigation, it is obvious that the chances are nearly equal that a single lock full of water would pass one boat up and another down. Or, in other words, it is as likely that the two boats will meet passing in opposite directions, as that one will closely follow another going in the same direction. It is, therefore, possible that the quantity of water estimated for 100 lockages across the summit, would be sufficient to pass 150 boats.

Gauge of Calumet river by U. S. Engineers—17,281 per min. by Bucklin, 5,323 per min.

S. Desplaines river Post & Paul, 1950 by Bucklin 1,000 per min.

S. DuPage river U. S. Engineers, 1665 by Bucklin 6916 per min.

The aggregate minimum discharge of the three rivers would then be shown thus:

Calumet, 5,333; *Desplaines*, 1,000; DuPage, 1,665=7,998 cubic feet per minute.

This quantity of water was to supply the filtration and evaporation of seventy-four miles of canal, the necessary lockage water, and the loss at the dams and upon the Calumet feeder. It is, therefore, obvious that there would have been barely a supply for a canal of ordinary dimensions, admitting that the water could be introduced (as it might have been) at the points desired.

The Calumet was gauged on the 17th of May and was found to discharge 8,296 cubic feet per minute, and again on the 24th of September, when the quantity was 6,137 cubic feet per minute, and still again on the 17th of October, when the discharge was reduced to 5,634 cubic feet per minute.

A very satisfactory measurement of the DuPage was obtained on the 21st of September and the discharge of water was then found to be 2,928 cubic feet per minute. (Can. Com. Rep., 1900, p. 204.)

6442 The construction of the perfectly water tight dam at Joliet has enabled us to ascertain with precision the quantity of water flowing in the *Desplaines*. This river has been nearly dried up; the measurement on the 20th of September showing 338 *cubic feet* and on the 21st of the same month 373 cubic feet per minute.

The quantity of water in all these streams continue to diminish till the first of November, when the probable quantities would have been about as follows, to-wit:

In the Calumet river.....	5,300	cubic feet per min.
In the <i>Desplaines</i> river.....	200	" " " "
In the DuPage river.....	1,888	" " " "

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Total .....7,300 " " " "

The necessary quantity of water to supply the canal from Chicago to *Marseilles*, is 9,924 cubic feet per minute. This would show a deficiency of 2,624 cubic feet per minute, admitting that all the water could be turned into the canal. There will be some loss at the dam at

the Calumet and upon three or four miles of the feeder, and also at the DuPage dam. It would, however, be safe to calculate that there could be introduced into the canal from these rivers the following quantities, to-wit:

From the Calumet river.....	4,500	cubic feet per min.
From the Desplaines.....	200	“ “ “ “
From the DuPage.....	1,600	“ “ “ “

Total supply .....	6,300	“ “ “ “
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Total supply .....	9,924	“ “ “ “
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Total deficiency .....	3,624	“ “ “ “
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There would not, it is true, be so large a deficiency except in *extraordinary dry seasons, and in most seasons probably none at all.*"

*Were the deep cut plan to be carried out at an average stage of Lake Michigan there would be an abundant supply of water drawn from the lake, not only for navigation, but for water power. There would be no locks to obstruct the passage of boats or lake vessels of good size between Chicago and Lockport. The water power at Lockport and Joliet would be greater and more permanent (at the usual stage of the lake), than it would be upon the shallow cut plan. The navigation of the canal would not be liable to interrupt from breaches in dams or embankments, and the plan is much more magnificent. Besides, if the waters of Lake Michigan do not get through this channel to the Mississippi, there is no other through which they can be conducted, and a great deal will have been said for nothing about mingling the waters of the lakes and with those of the Gulf of Mexico.*

In constructing the Illinois and Michigan Canal of the dimensions *now adopted*, reference has generally been had to a future enlargement. Through all the towns and proposed town sites, as Lockport, Juliet, DuPage, Ottawa, etc., the canal is nearly double, and in some instances more than double, the ordinary width. In the deep cutting, the spoil-banks were removed a sufficient distance to leave room for the widening of the canal, and in a few instances, if any, would there be any additional damages to be paid for property. However remote the period may be when an enlargement of this

work will take place, it is certainly the part of wisdom to provide for it now. That it will be enlarged, sooner or later, there can be no doubt, and also that *the Illinois river will be so improved (an indispensable improvement) as to meet the enlarged capacity of the canal.* (Can. Com. Rep., 1900, p. 205.)

- 6443a Feb. 21—1843—Enactment of “An Act to provide for the completion of the I. & M. Canal and for the payment of the canal debt.”

March 1—1845—Supplemental Act providing for execution by Governor of “a deed of trust to the said trustees of all the property and effects mentioned in the tenth section of said act; which said conveyance shall include the lands and lots remaining unsold, donated by the United States to the State of Illinois to aid in the completion of the said canal; to be held in trust as in said act stipulated.”

“The provision of the above act having been fully complied with, a meeting was held at the American Exchange Bank of New York on the 27th day of May, 1845, and William H. Swift and David Leavitt were elected trustees by the subscribers to the loans; William H. Swift being by ballot designated as president of the board. (William H. Swift was continued as president of this board until the termination of the trust in 1871.) On the 10th day of June following, his Excellency, Governor Ford, appointed Jacob Fry trustee on behalf of the State of Illinois.” (Can. Com. Rep., 1900, p. 208.)

FROM REPORT OF BOARD OF TRUSTEES, Nov. 30, 1848.

(Can. Com. Rep., 1900, p. 209.)

- 6444 “On the 24th of April, the board while in session at Chicago, received a report from the chief engineer, stating that the canal was so far completed as to be in navigable order, that the first boat (the General Fry) had passed over the Summit level from Lockport to Chicago on the 10th of April, and that the first boat which had passed through the entire length of the canal from La Salle to Chicago (the General Thornton owned by Isaac Hardy) had arrived at Chicago on the 23rd of April.”

“As a matter of some interest connected with the arrival of this boat, it may be stated that sugar, etc.,

from New Orleans, brought by the General Thornton to Chicago was received at Buffalo (via Mackinaw) on the 30th of April, some two weeks before the first boat had reached Buffalo by the Erie Canal.

The chief engineer states that all the work upon the main line of the canal is fully completed according to the original intention of the board, except three inconsiderable items, to-wit: First, some timbers for coping the towpath wall on the Summit; second, the painting of several bridges and aqueducts; third, the excavation of some 2,500 cubic yards of earth, and the building of 300 cubic yards of work on Sections 195 and 197. The whole cost of these is stated at \$3,900. The two first will be finished in the course of the winter, but the last cannot be economically done until the water in the Illinois river is low.

6444a "All the feeders are completed with the exception of the Calumet, which is the main feeder for the Summit level. Very unusual difficulties have been encountered in the excavation of this line, being for a great portion of the distance through a swamp, the material has been dredged out by means of steam excavations, as it was too soft to remove it by digging in the ordinary method, and hence the delay in its completion. It will be done in February and with the opening of navigation in the spring the waters of the Calumet river will be discharged upon the Summit level. The following table exhibits the cost of completing the canal and the feeders according to the report of the chief engineer:

Canal proper, including pumping engines, etc. ....		\$1,159,652.44
Calumet feeder, work done...	\$68,397.22	
Calumet feeder to be done, estimate .....	23,102.78	
		91,500.00
Kankakee feeder .....		84,573.29
Superintendence and contingencies .....		66,527.06
		<hr/>
Total cost of completion		\$1,401,192.79

From Woodruff's history of Will County: 'The Project of a ship canal to connect the waters of Lake Michigan with the navigable waters of the Illinois river was first suggested during the war of 1812, by



some writer in the Niles Register in 1816. The title to a strip 20 miles wide was obtained of the Indians with a view to such work.'

From the Northwest and Chicago, by Rufus Blanchard:

Previous to 1816 the united tribes of Indians known as Ottawas, Chippewas and Pottawattomies, claimed all the land between Chicago and the mouth of the Fox river. In order to secure undisputed possession of the river between these two points, a treaty was arranged between these tribes and Ninian Edwards, William Clark and August Chouteau, Commissioners Plenipotentiary of the United States; this treaty was consummated the 24th day of Augst, 1816, and was signed by the above named Commissioners and F. Assikinoek, otherwise known as Black Partridge, chief of the united tribes. The object in securing this strip was to construct a military road to facilitate the building of the proposed ship canal.

From the history of Chicago, by Bross, Book B, 1370, Chicago Public Library:

At the first session of the legislature in 1818, Governor Bond brought up the subject of a canal from Lake Michigan to the Illinois river. By an act passed July 14, 1823, a Board of Canal Commissioners was appointed, and in the autumn of that year a portion of the board, with Col. J. Post of Missouri, as chief engineer, made a tour of reconnoissance, and in the autumn of 1824, Col. R. Paul, an able engineer residing in St. Louis, was also employed. Five different routes were surveyed and estimates made of the cost of the canal. The highest estimate was \$716,110.00. In the autumn of 1829 the Commissioners came to Chicago, have employed James Thompson to survey and lay off the town. His first map bears date of August 4, 1830.

The beginning of the canal was celebrated July 4, 1836, by nearly the whole City of Chicago going up to Bridgeport on the small steamer George W. Dole, towing two schooners. Dr. Wm. B. Egan delivered the address and the Hon. Theophilus W. Smith began the ditch by throwing out the first shovelful of earth."

LOCKPORT, ILL., March 22, 1871.

*Messrs. Hoyne, Horton & Hoyne,  
Chicago, Ill.*

GENTS:—

Yours of the 20th inst. asking for 'certified copy of survey or location of the canal in 1836 and also in 1846 in Section 29 and 30, T. 39 North, Range 14 E.' I send you herewith a diagram showing the location as you desire, certified by A. J. Matthewson, the engineer who made the survey. The change in the location from the survey of 1836 to that upon which the canal was finally constructed was made in 1845 (not in 1846) when operations were commenced under the trust and was authorized by Section 13 of 'the act to provide for the completion of the Illinois and Michigan Canal, and the payment of the canal debt,' approved February 21, 1843.

Truly yours,

WILLIAM GOODING."

(Can. Com. Rep., 1900, p. 210.)

6448a

KANKAKEE FEEDER.

(Can. Com. Rep., 1900, p. 218.)

"A navigable feeder from the Kankakee river was surveyed in 1845 and ordered constructed in 1846. The width to be 40 feet at top water line, 26 feet at bottom, 4 feet deep except at lower end where the depth was to be 5 feet. The slope to be 2 to 1 raised 3 feet above top water line—delivery 2 inches to the mile. This feeder was completed in 1848. The termination of the feeder was at a point on the canal 1,820 feet S. E. of the N. W. corner of Section 31, Tp. 34 N., R. 9 passes in a southwest course across the Du Page river where it enters Section 36, Tp. 34 N., R. 8; thence S. W. 1,056 feet to the center section line 538 feet west of the east line of the section; thence south to a point 792 feet north of the south line of Section 36; thence southeast entering Section 3-34-9 again at a point 264 feet north of its southwest corner; crossing this corner it then passes through Section 6, 4 and 5 to a point near the center of the southeast quarter of Section 9; all in Tp. 33 N., R. 9, whence a dam was constructed across

6449

the Kankakee river and from which it received its supply of water.

The 90 foot reserve was surveyed in 1848 by Artemus J. Mathewson, a plat was made of the feeder and reserve and appears in the plat book number 2, Canal Records.

The total cost approximately very nearly to \$50,000." (Can. Com. Rep., 1900, p. 219.)

FROM A LETTER BY A. J. GALLOWAY, DATED APRIL 20, 1846.

"Canal Office, Lockport,  
April 20, 1846.

*"To the Board of Trustees of the Illinois and Michigan Canal.*

"GENTLEMEN:—The Secretary of our board has submitted to me the following order to which I have the honor to reply:

'Ordered, That the Chief Engineer be requested to report to the board the results of the surveys of the several feeders which have been made since the adjournment of the board on the 24th July last, together with the estimated cost of constructing each feeder; also that he communicate his opinion in reference to the most advantageous disposition to be made of the several feeders, and the best mode of supplying the different levels with a sufficiency of water for the purpose of navigation.'

The surveys of the feeders were commenced on the 14th of July last, and finished on the 6th day of November under the immediate direction of the principal assistant, who was aided by Messrs. Benjamin, Mathewson and Elder, Assistant Engineers, Mr. Elder, however, was not called into the service, until the surveys of the Columet had been completed.

Two feeders from the Kankakee river were surveyed; one commencing at the dam near Wilmington and terminating near lock No. 6 on the main line of canal, and the other at Goose Island, terminating at the main line nearly opposite the upper part of the town of Kankakee. The feeder from Wilmington would be received into the canal on the Joliet level, and the other upon the Dresden level; the former being 10.43 and the latter 4.44 miles in length.

The feeder from Wilmington is rendered expensive by the necessity of constructing more than a mile of it where the base of the tow path will be in the river and the outer slope will require protection, and also by the difficulty of procuring suitable earth for embankment for about three miles of the distance, and the expensive nature of the embankment across the valley of the Desplaines.

The aqueduct across the Desplaines on this line will also be an expensive structure. The estimated cost of this feeder is \$159,401.52.

The lower Kankakee feeder commences at a point very favorable to the construction of a permanent dam, and the route passes over ground well adapted to the cheap and permanent construction of the work, until it reaches the Desplaines river, which must be crossed by an aqueduct that will form much the most expensive part of the work. Every part of this feeder, however, can be made permanent at a very moderate cost, the whole estimate amounting to but \$48,363.68.

The feeders are all intended to be navigable and will be 40 feet wide upon the surface of the water, 26 feet wide upon the bottom, and 4 feet deep, except lower Kankakee feeder, in which the water is intended to be 5 feet deep. The slopes of the banks will be two to one, and they will be raised 7 feet above bottom or 3 feet above the top water line. A declivity of 2 inches per mile is given on each of the feeder." (Canal Com. Rep., 1900, p. 219.)

FROM E. W. WILLARD'S HISTORY, IN REPORT OF 1900:

"The Kankakee feeder has not been used for several years. The aqueduct that carried the water over the Desplaines and Du Page rivers has long since gone to decay. There are, however, over 125 acres of good land used for this feeder that now belongs to the State of Illinois." (Canal Com. Rep., 1900, p. 220.)

6454 "In the years 1847 and 1848 Artemus J. Mathewson, a surveyors and engineer, under the authority and direction of the Canal Trustees, surveyed and marked the lines of the 90-foot strip on each side of the canal

from one end thereof to the other and prepared and filed in the office of the Board of Trustees, maps and profiles of said survey." (Can. Com. Rep., 1900, p. 229.)

- 6457 "The Mathewson survey of 1847 and 1848 gave the width of the canal and the lines of the reverse the entire length of the canal. See plat books 1, 2 and 3 canal records. From La Salle to Joliet the towing path is located on the south side of the canal, and from Joliet to Bridgeport it is on the north side. From Bridgeport to the center of Section 21, Tp. 14 N., R. 14 East, there was reserved from sale 16 feet in width on the south side of the Chicago river for towing purposes, and for a long time this reserve was used for that purpose. The State of Illinois secured title to the canal, its feeders and reserved land through Section 16, known as school sections, Ottawa Center, Marseilles, Joliet, Lemont and Canalport section (30-39-14), by the congressional acts of 1822, 1827, and 1831, and the legislative enactments of 1823, 1829, 1831, 1836, 1837 and 1839. See also La Salle County, Will County and Canal Records 1836 to 1845." (Can. Com. Rep., 1900, p. 235.)
- 4684 Counsel for defendant then offered in evidence a volume containing the issues of the Chicago American published in the years 1835 and 1836, in Chicago, Illinois; a weekly paper; from the issue of May 14, 1836, of this paper, an advertisement appearing therein and reading as follows: The heading of the advertisement is:

"1836

Western Transportation.

The New York and Oswego Line.

The proprietors of the above line will be prepared on the opening of navigation to forward property from New York by the Eckford Line of tow-boats to Albany daily; thence by the above line of canal boats daily to Oswego, and thence by steamboats and vessels of the first class to any point on Lake Ontario and via the Welland Canal to all ports on the upper lakes. William Sabine having connected himself with a line of transportation wagons from Chicago to the head of Navigation on the Illinois River will forward goods consigned

4685 to him by the above line to any point on the Illinois River or St. Louis."

There is a date under that: "March 28th."

Then signatures:

"R. J. VAN DEWATER, New York.  
JOHNSTON HOWLETT & Co., Foot of  
State Street, Albany, Up Stairs.  
HENRY FITZHUGH, Oswego, (Pro-  
prieters)

Refer to A. B. Meech and Co., Herriman and Nash, Doremus, Suydam and Nixon, and S. Grosvenor and Co. New York: Meech, Jackson and Co., Albany; Sulter Livingston and Co., Utica; B. B. Hyde and Co., Rome; Noble and Palmer, Manlius; Dan'l Spencer and Co., Syracuse; Buckley and Clark, Sacketts Harbour; J. W. Fuller and Co., Alexandria Bay; White and Hooker, Morristown; R. T. Sec. and Co., Cape Vincent; E. B. Allen and O. Bacon, Ogdensburgh; O. Smith and O. Hathaway, Youngstown; J. Nevins, Niagara, U. C.; J. Brown and Co. and S. Barnham, Toronto, U. C.; Truax and Phillips, Kingston, U. C.; E. P. and D. Smith, W. Barnham, Port Hope; A. Land and D. C. Gunn, Hamilton, U. C.; H. and S. Jones, Brockville, U. C.; Tracy and Harrison, Erie, Penn.; T. Richmond and Co., Richmond, Ohio; John E. Lyon, Cleveland; J. W. and T. Wickham and J. Flee'harty, Huron, Ohio; M. L. Babcock and Co., Sandusky; John W. Smith, Perrysburg; John L. Whiting, Detroit.

William Sabine, Chicago.

R. J. VanDewater, agent,

Corner of Water and Broad Sts., New York."

4686 Counsel for defendant then offered:

"The same advertisement appearing in the issue of May 21st, 1836, of this same paper; and also in the issue of May 28th, 1836, of this same paper."

Counsel for defendant then produced another volume containing the issues of the Daily Chicago American published in the year 1839; and offered in evidence from the issue of this paper published September 14, 1839, the following advertisement:

*"Notice to Travelers.*

The traveling public are informed that the mail stage from Chicago to Galena leaves the general stage office at Chicago every Sunday, Tuesday and Thursday and arrives at Galena every Monday, Wednesday and Friday, making it through in two days, and fare reduced to \$12.50 for a distance of 156 miles. Fare from Rockford to Chicago \$6. Mail stages leave for Dixon's Ferry 4687 every Monday, Wednesday and Friday, and for Naperville, Warrenville, Geneva and St. Charles same days and return every Tuesday, Thursday and Saturday. From St. Charles the mail line is continued on direct, three trips a week, for De Kalb, Court House, then to Oregon City and Buffalo Grove and there connects with the Peoria and Galena Mail stage, making the line direct to Galena. The mail stage for Milwaukee leaves the general stage office at Chicago every Sunday, Tuesday and Thursday and returns every alternate day. Last, though not least, a daily mail stage leaves the above named office for Peoria and makes the trip from Chicago to Peoria, 170 miles in from 30 to 35 hours, by steamboats and stages—stages from Chicago to Peru and steamboat from Peru to Peoria. Fare, whole distance, \$11, and found on board the boat. This line passes through Lockport, Juliet, Ottawa and Utica to Peru.

Extras furnished at all times for nine seats at regular fare. The proprietors will spare no pains to make the traveler comfortable, and safe, and hope that if they do justice to the public, by the public they will be supported.

(Signed) E. C. STOWELL,  
*Agent for the Proprietors.'*

Dated, 'September 4th.'

4688 It is stipulated by counsel that the same advertisement as last read appears in each issue of the Daily Chicago American published after September 14, 1839, up to and including the issue of November 9, 1839.



AT A SUPREME COURT, Begun and held at Springfield on Tuesday, the Fifth day of October in the year of our Lord One Thousand Nine Hundred and Nine, within and for the State of Illinois.

Present:

WILLIAM M. FARMER, *Chief Justice*,  
JAMES H. CARTWRIGHT, *Justice*,  
ALONZO K. VICKERS, *Justice*,  
FRANK K. DUNN, *Justice*,  
JOHN P. HAND, *Justice*,  
ORRIN N. CARTER, *Justice*,  
GEORGE A. COOKE, *Justice*,  
WILLIAM H. STEAD, *Attorney General*,  
WARREN C. MURRAY, *Bailiff*.

Attest:

J. McCAN DAVIS, *Clerk*.

Be It Remembered, that afterwards, to-wit, on the 26th day of October, 1909, the opinion of the Court was filed in the words and figures following to-wit:

People <i>ex rel.</i> C. S. Deneen,	} Error to	
No. 6242 <i>vs.</i> Appellant,		} Appeal from Circuit Court,
Economy Light & Power Co.		

Docket No. 6242—Agenda 1—June, 1909.

People of Illinois *ex rel.* Charles S. Deneen and William H. Stead, Appellant *vs.* Economy Light and Power Co., Appellee.

Mr. JUSTICE VICKERS delivered the opinion of the court:

This is a direct appeal to this court from a decree of the circuit court of Grundy county dismissing for want of equity an information in the nature of a bill in equity filed by the Attorney General on behalf of the People, on the relation of Charles S. Deneen, Governor of the State of Illinois, against the Economy Light and Power Company, to restrain said company from erecting a dam across the Desplaines river and to cause the removal of that portion of the dam already constructed, and to prevent other injuries to the prop-

erty of the State which it is alleged will result from the construction and maintenance of said dam.

Appellant bases its claim to relief on three propositions, as follows: (1) That the State of Illinois owns the bed of the river at the point where it is proposed to build said dam; (2) that the Desplaines river is a navigable stream, and that the proposed dam would constitute an obstruction to navigation; (3) that certain contracts executed by the commissioners of the Illinois and Michigan canal, under which appellee claims certain rights in connection with the construction of said dam, are void, and that no rights were acquired by or can be asserted under said contracts.

It is conceded by appellee that if the State of Illinois owns the fee in the bed of the Desplaines river at the point where the proposed dam is to be located, or if said river is a navigable stream at that point, appellee has no right to build the dam. Whether the same result would follow if the instruments referred to in the third proposition were held invalid is one of the controverted questions between the parties. The questions involved in each of appellant's propositions arise out of facts which have but little, if any, bearing on the other contentions. It will therefore conduce to a clearer understanding to examine these propositions separately, in the light of the facts applicable to each.

**THE TITLE OF THE STATE TO BED OF THE RIVER.**—The validity of appellant's claim of title to the bed of the river at the point where the dam is located depends upon the construction of certain statutes passed by the legislature in relation to the Illinois and Michigan canal. The consideration of the legal questions involved in appellant's claim of title to the bed of the river will be facilitated and the ultimate result clarified by a brief review of the history of the Illinois and Michigan canal prior to the passage of the particular statute a construction of which is involved in this question.

The possibility of connecting the waters of Lake Michigan with the Illinois river by means of an artificial channel, thence through the Mississippi river to the Gulf of Mexico, thus establishing a continuous waterway for commerce from the lakes on the north to the gulf on the south, was at a very early time appreciated and its consummation cherished by the early traders and explorers as a work of first importance, both from a commercial and military standpoint. The portage between the south branch of the Chicago river and the Desplaines was only a few miles, and it was confidently be-

lieved that these two streams could be connected by an artificial channel at a cost that would be trifling in comparison with the commercial benefits that were expected to result. Experience has shown, however, that the cost of the canal, first and last, has been nearly twenty times the original estimate and that its practical benefits have fallen much below its promoters' expectations. The subject of constructing the canal was first brought to the attention of the Federal Congress in 1801 by Albert Gallatin, in a report recommending its construction by the general government. In 1816 a government survey was made of the proposed route, and after Illinois was admitted into the Union the attention of the new State was turned to the proposed connecting waterway. In 1822 Congress passed an act authorizing the State of Illinois to survey and mark through the public lands of the United States the route of a canal connecting the Illinois river with the southern bend of Lake Michigan, and vesting in the State the perpetual use of a strip of land ninety feet wide on each side of said canal for canal purposes, subject to certain conditions which have either been complied with or waived by subsequent acts and therefore need not be stated. (Stead's Canal Laws, p. 1.)

During an extra session of the Illinois legislature, in 1826, a memorial was addressed to the Congress of the United States in which the great advantages, both to the nation and the State, of the proposed canal were eloquently set forth and the liberality of Congress was appealed to to make a grant of public lands to aid the State "to commence and complete this great and useful work." In this memorial it was stated that "your memorialists have caused the route to be explored and estimates to be made of the probable expense of the work, from which it appears that the cost of constructing the canal will not be less than \$600,000 and may possibly amount to \$700,000." The effect of this memorial was to attract the attention and awaken the generous patronage of the Federal Congress, and on March 2, 1827, an act was passed granting to the State of Illinois, for the purposes stated, a quantity of land equal to one-half of five sections in width on each side of said canal, from one end thereof to the other. The lands thus granted to the State, when selected and set apart, were found to contain approximately 300,000 acres, which were subject to the disposal of the State legislature "for the purposes aforesaid and no other." In 1829 the legislature passed an act authorizing the appointment of

a board of canal commissioners to explore, examine, fix and determine the route of the canal, and dispose, by sale, of the lands and lots and commerce the work. Under this act Gov. Edwards appointed Charles Dunn, Dr. Gersham Jayne and Edmond Roberts as commissioners. For lack of funds the commissioners were able to accomplish but little. February 15, 1831, an amendatory act was passed. Under the provisions of these two acts the board of commissioners laid out the towns of Chicago and Ottawa and caused a new survey and estimate to be made by engineer Bucklin, whose estimate showed that the canal, instead of costing \$600,000 or \$700,000, as the legislature had stated in its memorial, would cost \$4,043,386.50,—and this estimate proved to be too low by half. In view of the unexpected increase in the cost of the canal the plan of substituting a railroad for the canal was favorably considered for a time, and with this in view a survey and estimate for the railroad were made, a law passed abolishing the office of canal commissioners and the consent of the Federal government to use the land granted in constructing a railroad instead of a canal was obtained.

In 1835 the canal proposition was again taken up and an act passed authorizing the Governor to negotiate a loan, not exceeding \$500,000, solely on the pledge of the canal lands and tolls. Certificates were to be issued, called "Illinois and Michigan canal stock," which were to be sold at not less than face value. This effort to raise money proved a failure. Ex-Gov. Coles, who then resided at Philadelphia, was appointed agent of the State to negotiate the loan, and in April, 1835, he wrote that capitalists were unwilling to take the stock certificates because they were not based upon the faith of the State. To obviate the objections thus raised the act of January 9, 1836, was passed, which repealed the act of 1835 and authorized the same loan of \$500,000 on the credit of the State, which was irrevocably pledged for the payment of both principal and interest. The money thus borrowed, together with the proceeds of canal lands and lots, constituted a fund with which the actual construction of the canal was commenced, and on July 4, 1836, ground was first broken for the canal.

Two general plans of construction had been estimated and recommended. One, which is described as the "deep-cut" plan, provided for a channel six feet below the water level of Lake Michigan, and contemplated the maintenance of a channel sixty feet wide at the top and forty feet at the bottom and

a depth of six feet, supplied by the direct flowage of water from Lake Michigan. The cost of the canal under the deep-cut plan was estimated at more than \$10,000,000. This excess in cost over the available funds led to the consideration and adoption of the "shallow-cut" plan, which provided for a channel twelve feet above the water level of Lake Michigan, and contemplated to supply the channel with water by feeders from the Calumet or Desplaines river. Up to the first of January, 1839, the gross expenditures on the canal derived from loans and the sale of lands and lots amounted to \$1,400,000. All of the canal, except about twenty-three miles between Dresden and Marseilles, was under contract, and the jobs let were roughly estimated at \$7,500,000. In this situation the legislature directed the commissioners to borrow \$300,000 and the Governor to make a further loan by the sale of \$4,000,000 of State bonds. These bonds were disposed of to irresponsible parties, some of whom paid a portion, others practically nothing, so that the State lost several hundred thousand dollars in the sale of these bonds.

On February 26, 1839, the General Assembly passed an act which is of special importance in this connection, since it is upon this act appellant rests its claim of title to the bed of the river at the point where the proposed dam is located. Section 1 of the act of 1839 provided that the sales of canal lands and town lots heretofore authorized by law shall be regulated as follows: Under the title of "conditions of sales" it was provided: "In all sales of lands and lots under the provisions of this act the following conditions shall be annexed and shall compose part of the contract." By condition 9 it is provided as follows: "That no stream of water passing through the canal lands shall pass by the sale so as to deprive the State from the use of such water, if necessary to supply the canal, without charge for the same." Condition 11 is as follows: "Lands situated upon streams which have been meandered by the surveys of public lands of the United States shall be considered as bounded by the lines of those surveys and not by the stream." At the time this act was passed the State of Illinois owned the lands on both sides of the Desplaines river where the dam in question is located. If the title to this land had passed out of the State under the act of 1839 there would be much force in appellant's contention that the riparian owners would only obtain title to that portion of land within the meander lines, the effect of which would be to reserve the title to the bed of

the stream in all odd numbered sections bordering upon either side of the river in the State, and this, as we understand, is appellant's position.

The proposed dam is located in the south-east quarter of section 25, township 34, range 8, east of the third principal meridian, in Grundy county. Section 25 was one of the sections embraced in the government grant of 1827. Both parties concede that the title to the bed of the stream passed to the State under the government grant. The point at issue between the parties is whether such title passed out of the State when it sold said south-east quarter of section 25, or whether the grantee only took title to the meander line, as is provided by condition 11 in the act of 1839.

Returning again to the further history of the canal, we find that, owing to the panic of 1837 and the general shrinkage of values, the State was seriously embarrassed and its credit impaired. At this time \$1,000,000 of State bonds bearing six per cent. interest were sold in London for eighty-five cents on the dollar. In 1841 the State defaulted in the payment of interest on her public debt and her financial embarrassment became alarming. The situation was greatly aggravated by the collapse of the State banks, in 1842. The State refused to take State bank paper for taxes, and the taxpayers did not have coin or the means of procuring it. There was a general stagnation in business and values rapidly declined. The State at that time owed \$14,000,000, on which it was unable to pay interest. Repudiation was openly advocated, and for a time "the fair name of Illinois became freely associated with dishonor." There was a crisis in the affairs of the State as well as in the affairs of the projected canal. Strange as it may seem, the Illinois and Michigan canal, in aid of which the credit of the State had been pulled down, was now confidently looked to as the only means of lifting it up. It was argued the advantages and facilities to be afforded by it would cause immigrants and wealth to pour into the State. To meet the dire situation and to insure the completion of the canal, Justin Butterfield, of Chicago, first suggested the idea of inducing the holders of canal bonds to advance the money for its completion upon the pledge of the canal, its lands and revenues to the bondholders in the nature of a first mortgage, and Gov. Ford recommended the adoption of this plan in his first message to the General Assembly. Accordingly, on February 21, 1843, the legislature passed an act authorizing the Governor to negotiate a



loan of \$1,600,000 solely on the credit and pledge of the canal property, its tolls, revenues and lands, for a term of six years, bearing six per cent. interest. Said act provided that the holders of canal bonds and other evidence of indebtedness of the State, for the purpose of aiding in the construction of the canal, should be first entitled to subscribe for said loan in proportion to the amount held by the several creditors. It was provided in said act that a board of canal trustees should be appointed, to be known and designated as the "Board of Trustees of Illinois and Michigan Canal," one of whom should be appointed by the Governor and the other two elected or appointed by the subscribers to the said loan. Section 10 of said act provided that for the purpose of placing in the hands of the trustees full and ample security for the payment of said loan, and the interest thereon, and for the purpose of securing a preference in the payment of the debts held by the persons who would subscribe for the new loan, the "State does hereby irrevocably grant to the said board of trustees of the Illinois and Michigan canal the bed of the said Illinois and Michigan canal and the land over which the same passes, including its banks, margins, tow-paths, feeders, basins, right of way, locks, dams, water power, structures, stone excavated and stone material quarried, purchased, procured or collected for its construction, and all the property, right, title and interest of the State of, in and to the said canal, with all the hereditaments and appurtenances thereunto belonging or in anywise appertaining, and also all the remaining lands and lots belonging to the said canal then or which hereafter may be given, granted or donated by the general government to the State to aid in the construction of said canal, and the buildings and erections belonging to the State thereon situated; the said board of trustees to have, hold, possess and enjoy the same as fully and absolutely, in all respects, as the State now can or hereafter could do, for the uses, purposes and trusts hereinafter mentioned." The only property excepted from this act were "all canal lands and lots heretofore sold by the board of commissioners upon which moneys are now due or may hereafter become due," which were reserved to the State. After considerable delay and difficulty the creditors of the State finally advanced \$1,600,000 on the faith of the act of 1843, and the final completion of the canal was at last an assured fact.

On June 26, 1845, Thomas Ford, as Governor of the State of Illinois, executed a deed to William H. Swift, David Leavitt



and Jacob Fry, trustees of the Illinois and Michigan canal, under authority vested in him by section 21 of the act of 1843, conveying to said trustees, in the language of said act, all of the canal property which the State then owned, including "the lands and lots remaining unsold, donated by the United States to the State of Illinois to aid in the completion of the said canal, \* \* \* to have, hold and enjoy the said property, with the right of controlling, managing, selling and disposing of the same." There is no restriction in the act itself, or in the deed made by the Governor under it, which lends support to appellant's claim that the bed of the river was reserved to the State.

On October 22, 1860, the canal trustees sold and conveyed to Charles E. Boyer, for a consideration of \$1556, 196.61 acres of land in section 25, township 34, range 8, in Grundy county, and by *mesne* conveyances the title of said tract is now vested in appellee. The proposed dam is located wholly on this tract. Conveyance to Boyer was made by the canal trustees "under authority vested in said board by an act of the legislature of the State of Illinois of February 21, 1843, entitled 'An act to provide for the completion of the Illinois and Michigan canal and for the payment of the canal debt.' " which authority is recited in the fact of the deed itself. The granting clause of said deed is as follows: "In consideration thereof and the premises, said board of trustees of the Illinois and Michigan canal has granted, bargained and sold, and by these presents do grant, bargain and sell, to the said Charles E. Boyer, the said tract of land above designated and described." The following is the *habendum* clause of the said deed: "To have and to hold the same, together with the rights, privileges, immunities and appurtenances thereunto belonging, unto the said Charles E. Boyer, his heirs and assigns forever." There are no exceptions, limitations, reservations or conditions in this deed. If the title to the bed of the stream did not pass by this deed it is because the trustees had no power to convey it.

Under the government grant of 1827 the State obtained title to all of section 25, including the bed of the river through that section. By the act of 1843, and the deed of the Governor made thereunder, the title to all of the unsold portion of said section passed to the trustees of the Illinois and Michigan canal, and by their deed the title to the southeast quarter of said section on which the dam is located was vested in Boyer, and his title, as we have seen, now rests in the appel-

lee. Under well established rules of law these several conveyances carried the title to the bed of the stream, in the absence of any language clearly denoting an intention of stopping at the edge of the river. (*Braxton v. Bressler*, 64 Ill. 488; *Davenport Bridge Railway Co. v. Johnson*, 188 id. 472.) There is no difference in the application of this rule between navigable water-courses and those which are not navigable. In grants upon navigable waters above tide waters the riparian owner takes title to the thread of the stream, subject to an easement in the public for the purpose of navigation, while as to the waters not navigable the title to the bed of the stream passes absolutely, free from any burdens in favor of the public. (*Washington Ice Co. v. Shortall*, 101 Ill. 46.) Where a riparian proprietor owns the land on both sides of a river, he is the owner of the whole of the bed of the stream to the extent of the length of his lands upon it. (Angell on Water-courses, sec. 5.) This is the rule of the common law, which has been adopted in this State and applied by this court to the Mississippi river in *Middleton v. Pritchard*, 3 Scam. 510; to the Rock river in *Braxton v. Bressler*, *supra*; to the Chicago river in *City of Chicago v. McGinn*, 51 Ill. 266; to the Calumet river in *Washington Ice Co. v. Shortall*, *supra*; and to the Desplaines river in *Board of Trustees v. Haven*, 5 Gilm. 548, and *Druley v. Adam*, 102 Ill. 177. The general rule is, that when riparian estates are conveyed the owner may reserve the land under water; but the general presumption is that the purchaser's title extends as far as the grantor owns, in both tidal and fresh waters. (Gould on Waters, sec. 195, and cases there cited.) There is nothing in any of the conveyances concerning the south-east quarter of section 25 to indicate an intention to reserve that portion of said land in the bed of the Desplaines river. On the contrary, the language of the act of 1843, and the deed of the Governor made in pursuance thereof, is so broad and comprehensive as to preclude the State from asserting title to the bed of this stream. Anything found in the act of 1839 manifesting an intention of the State at that time to limit sales of canal lands within the meander lines of the Desplaines river must be held inconsistent with the comprehensive language of the act of 1843 and superseded thereby. We do not, however, mean to be understood as holding that the act of 1839 was superseded in its entirety by the act of 1843, but we do hold that as to sales made under the act of 1843 to procure money with which to pay debts created thereunder, such

sales were not affected by the limitations in the act of 1839. After the trust created by the act of 1843 was executed and the debts for which the canal properties were pledged under that act were paid and the canal properties turned back to the State in accordance with section 9 of the act of 1843, any subsequent sales of canal lands would not be controlled by the act of 1843. The record shows that at the time the lands on which the dam in question is located were sold the debt was not fully paid, and the deed executed by the canal trustees shows by its recitals that it was made under the power conferred by the act of 1843. Deeds made by the canal trustees under the act of 1843 to lands bordering on the Desplaines river conveyed the title to the purchaser to the thread of the stream.

Appellant also contends that since the undisputed evidence shows that the Desplaines river was meandered by the government surveyors, such meander line is the boundary of riparian proprietors. A meander line is not a boundary line, but is designed to point out the sinuosities of the bank or shore and a means of ascertaining the quantity of land in the fraction which is to be paid for by the purchaser. (*Whitaker v. McBride*, 107 U. S. 510; *Albany Railroad Bridge Co. v. People*, 197 Ill., 199.) An exception to this general rule seems to be recognized where the meander line is run and monuments are erected, but in the case at bar the evidence fails to show that any monuments were erected on the meander line, hence this case falls within the general rule and not within the exception. The State of Illinois is not the owner of the bed of the Desplaines river at the place where the proposed dam is located.

**THE NAVIGABILITY OF THE DESPLAINES RIVER.**—The question which has received the most exhaustive treatment by counsel relates to the navigability of the Desplaines river. The evidence introduced upon this question fills more than one thousand printed pages in the abstract, and to its discussion counsel have devoted several hundred pages of their briefs. If the dismissal of the bill by the court below had been without prejudice to the right of the State to renew its application for an injunction such action on the part of the court below might be sustained because of the utter failure of appellant to prove that the construction of the proposed dam will be an obstruction to the present navigation of the river. There is no proof that the river is now being used as a public highway for commerce. On the contrary, the evidence not

only shows that the river is not being so used, but it shows affirmatively that, owing to the presence of numerous other dams and some fifty or more bridges which span the river, it would be impossible, under existing conditions, to navigate the same. There being at present no navigation whatever upon the river, obviously the dam in question cannot be said to be an obstruction to navigation that has no existence in fact. But the decree of the court below dismissed the bill for want of equity, without reserving any right to the State to renew this application for relief on the ground that the dam in question was being erected in a navigable stream, and rendered a final decree based on the finding that the river is not navigable, settling this question not only for the present but for all time to come, so far, at least, as the parties bound by this decree are concerned. We regard the question, therefore, as properly presented for our consideration on its merits.

The Desplaines river has its source in the south-eastern part of Wisconsin, and flows in a southerly direction, almost parallel with the western shore of Lake Michigan, through the counties of Lake and Cook, in this State, until it reaches a point nearly opposite the western end of Forty-seventh street, in the city of Chicago, where the river curves and takes a south-westerly course, passing the cities of Lockport and Joliet, and thence to a point in Grundy county, where it unites with the Kankakee river, thus forming the Illinois river. The entire length of the river is something over one hundred miles, but in determining the question of its navigability we will have no occasion to consider that portion of the river above Riverside, since it is not contended that that portion of the river is or ever has been navigable. The maintenance of the charge in the bill that the river is a navigable stream does not impose on appellant the burden of showing that the stream was navigable in its entirety, (*Schulte v. Warren*, 218 Ill. 108,) or that the navigable portion of such stream was open for use all the year round. (*Pierpont v. Lovelace*, 72 N. Y. 211; *Burke Co. v. Catawba Lumber Co.* 116 N. C. 731.) Appellant contends, and appellee seems to concede, that if it is established that the Desplaines river is navigable from Lockport to its mouth the decree of the circuit court should be reversed, even though the court might be of the opinion that the river was not navigable at any other place. We have no doubt of the correctness of this proposition as an abstract statement of the law. We will therefore

confine our consideration of this question primarily to that stretch of the river, about nineteen and one-half miles in length, extending from Lockport to the mouth of the river.

The evidence shows that there is quite a fall in certain portions of the river between these two points. From Lockport to Joliet there is a fall of thirty feet in a distance of four and one-half miles, and from dam No. 1 in Joliet to the head of Patterson's island there is a fall of twenty-one feet in three and one-half miles. Then there is a stretch of about five miles, known as Lake Joliet, in which there is practically no fall. Below the foot of Lake Joliet the river divides and forms what is called Treat's island. Going down the river the main channel is on the left of the island, and there is a fall of nine and one-half feet in one mile. After passing Treat's island the river is again united and forms a pool or lake about one mile long in which there is very little fall. Going down the river the next stretch, at a point called Smith's bridge there is a fall of about two and seven-tenths feet in one mile. Passing the rapids at Smith's bridge another pool is encountered, called Lake DuPage, where there is a fall of two feet in three and one-half miles. In the last half mile above the mouth of the river there is a fall of three and one-half feet. It is across the lower end of this stretch that the proposed dam is located. The bottom of the river from Lockport to the dam in question, with the exception of that portion under Lake Joliet, is covered with a large number of bowlders. The bottom of Lake Joliet is soft. The evidence shows that these bowlders are of various sizes, some of them between two and three feet in diameter. Some of them are covered entirely with water, while others project slightly above the surface of the water. It is also shown that in going down the river in a skiff or any kind of boat there is great danger of coming in contact with these bowlders. The current is so strong that it is not possible to row a boat up stream over these rapids. In addition to the natural barriers already spoken of, the evidence shows that the stream is tortuous and the channel very narrow at places. The slopes in the river already given do not represent the greatest fall that can be found in this stretch. The evidence shows that there is near the head of Treat's island a fall of seventeen feet to the mile, and near the foot the slope is eighteen feet to the mile, and in the right-hand channel opposite Treat's island there is a space of five hundred feet in which the fall is fifty feet to the mile, and if shorter distances are taken even

greater slopes than these will be found to exist. At one place near the mouth of the river there is a fall for three or four hundred feet of twenty feet to the mile. Between the mouth of the river and Lockport there are thirteen bridges across the river, none of which have draws to permit the passage of boats, if such passage were otherwise possible. Two of these bridges are railroad bridges, and all of them are permanent steel structures. Above Lockport there are some forty other bridges across the stream, constructed for steam or electric railroads and for wagons. The width of the river varies greatly. At some places it is not more than sixty feet wide, while in the widest place in Lake Joliet it is over one thousand feet wide. The evidence shows that the depth of water in the river varies considerably in different places and also at different times in the same places. A chart showing the gauge readings at Riverside, a point twenty-eight miles above Joliet, shows the number of days in each year during which the river was dry at this point, which indicates that there were from twenty-four days in 1890 to two hundred and thirteen days in 1895 during which the river was dry at this point. This chart also shows the number of days during each of these years when there was a discharge of less than six inches of water at Riverside, the result of which is, totaling the number of dry days and the days showing less than a six-inch discharge, that there were from one hundred and twenty days in 1888 to three hundred days in 1901 when the river was either dry or showed less than six inches of water at Riverside. The depth of the river during the balance of the year is not shown on this chart. These gauge readings also show that the dry or low periods did not occur during the same time in each year. Every month in the year is represented several times during the years covered by this chart, from which the conclusion is drawn that there were no regular periods when a given stage of water could be safely expected.

We refer to the readings on the Riverside gauge, not because of their bearing on the question of navigability at that point, but for the reason that they tend to show the natural volume of water in the channel above the points where the volume is increased by the additions made by the Illinois and Michigan canal and the drainage channel, which added from 250,000 to 400,000 cubic feet of water per minute to the river below the point of connection.

Appellant strongly contends that the rights of appellee as



riparian owner are to be determined with reference to the conditions that exist since the deepening of the Illinois and Michigan canal and the construction of the sanitary district channel, by means of which the volume of water in the Desplaines river has been greatly increased. It is argued that the navigability of the river is to be determined with reference to the changed condition and not as the stream existed in a state of nature. Appellant's position, as we understand it, is this: Assuming the stream to be unnavigable in its natural condition, the State may by artificial means so change the stream as to make it navigable and thus destroy the vested property rights of riparian owners upon the said stream. This position is untenable. The property rights of riparian owners in the bed of an unnavigable stream are as sacred as any other property right, and such owners cannot be deprived of those rights, without compensation, by artificial additions to the waters of the stream whereby it is rendered navigable. To hold that the State can by artificial means make a stream navigable which in a state of nature was not navigable, and thereby deprive riparian owners of their property rights in the bed of the stream, is simply to hold that private property may be taken or damaged for public use without compensation.

The contention of appellant upon this question is contrary to the authorities. In *Thunder Bay River Booming Co. v. Speechly*, 31 Mich. 36, the court, speaking by Judge Cooley, upon this question said: "No such inference is warranted by the decisions. The highway they recognized is one *sui generis* and in which the public rights spring from peculiar facts. It is a public highway by nature, but one which is such only periodically and while the natural condition permits of a public use. \* \* \* But at periods when there is no highway at all there is no ground for asserting a right to create a highway by means which appropriate or destroy private rights. The doctrine that this may be done without compensation to parties injured is at war with all our ideas of property and of constitutional rights. The most that can be said of this stream during the seasons of low water is, that it is capable of being made occasionally navigable by appropriating for the purpose the water to the natural flow of which the riparian proprietors are entitled. It is highly probable, in view of the large interests which are concerned in the floatage, that the general public good would be subserved by so doing, but this fact can have no bearing upon the legal ques-



tion. It is often the case that the public good would be subserved by forcing a public way through private possessions, but it neither should be nor can be done, under any circumstances, without observing the only condition on which it can be permitted in constitutional government, namely, that the private proprietor be compensated for the value which he surrenders to the public."

In *Druley v. Adam*, *supra*, this court, in speaking of the added volume of water to which the proprietors of the Haven dam were entitled by reason of the deep cut in the Illinois and Michigan canal, said (p. 206): "It may be quite true that appellee has now more water than he had before the deepening of the Summit level, and that contrasting his condition now with his condition then he is not injured, but he is entitled, by virtue of his position as lower proprietor, as has been shown, to the benefit of all improvements whereby the flow of the water in the river is increased, and this property right cannot be taken from him without his consent. The right which the lower riparian proprietor has to avail himself of all benefits resulting from improvements by upper riparian proprietors is obviously a property right growing out of the nature and necessities of flowing water and his position upon the stream, and of which, therefore, he can no more be deprived, without his consent, than of any other property right."

The rule that the navigability of the stream is to be determined with reference to its natural condition is supported by the numerous other authorities: *Hall v. Lacy*, 3 Grant's Cas. 264; *Carter v. Thurston*, 58 N. H. 104; *Ellis v. Collee County*, 70 Ala. 490; *Straton v. Currier*, 81 Me. 497; *United States v. Rio Grande Dam and Irrigation Co.* 174 U. S. 690; *In re Ball*, 10 Wall. 557; *In re Montello*, 20 id. 431.

We are aware that there is a line of cases which at first blush may appear to be in conflict with the rule laid down in the authorities above cited. While the rule is well founded, both upon reason and authority, that a stream not navigable in its natural condition cannot be made so by artificial means, so as to deprive riparian owners of vested rights without compensation, it is equally well established that a stream which is, in fact, navigable in its natural state may be improved for the purpose of enlarging its usefulness, and the public will have a right to the enjoyment of the easement in its enlarged condition. It is to this principle that the cases of *Schulte v. Warren*, *supra*, and *Mendota Club v. Anderson*,

101 Wis., 479, and other like cases relied on by appellant, are to be referred. There is nothing in this line of decisions that is in conflict with the rule stated above or the authorities cited in support thereof. In view of the constitutional inhibition against the taking or damaging of private property for public use without compensation, the rule must, of necessity, be that the State cannot directly by its own act or indirectly through the act of any of its agents change an unnavigable stream to one that is navigable, and thereby destroy or damage the private property rights of adjacent owners, without making compensation. The State can no more establish a waterway over private property without compensating the owners than it can build a railroad or a public highway over farm lands without paying for the right of way and all damages to property not taken. The same constitutional provision that protects property rights in real estate above the water line of an unnavigable stream extends to and protects that which is below the water, guaranteeing the same full measure of enjoyment to the owner in the one case as well as in the other. The view is supported by the decision of this court in *City of Chicago v. Laughlin*, 49 Ill. 172, where, on page 177 of the opinion, the following language is used; "It would be monstrous that the city should, at pleasure, make changes in this stream so as to render buildings on the wharves an obstruction and then require their removal without compensation. Such power would be more vast and absolute than can be exercised by the State itself. The city government is created and has its power delegated for the better protection of individual rights, and not that they may be disregarded or destroyed."

The widening or deepening of navigable streams, or the improvement of those which are not navigable so that they may become so, or the construction or improvement of harbors, are works of a public nature, conferring benefits on the public at large. Such improvements may be made and paid for out of the general treasury, from funds raised by taxation. The Supreme Court of the United States, in *County of Mobile v. Kimball*, 102 U. S., 691, decided that the State might authorize a county to improve a public harbor, to be paid for by bonds which were ultimately to be paid by general taxation upon property of the county. (See *Page & Jones on Taxation by Assessment*, sec. 360.) But under the law of this State as laid down in *City of Chicago v. Law*, 144 Ill. 569, a navigable stream cannot be improved and the cost

thereof levied by a special assessment upon the real estate fronting upon such water-course. In that case an attempt was made by the city of Chicago to improve the south branch of the Chicago river and to charge the cost of such improvement by a special assessment against the lands and lots fronting on the same, and this court, in denying the power of the State to make such improvement by a special assessment, on pages 576 and 577, said: "The river is a navigable stream of the United States. It connects with Lake Michigan, and by means of the lake with the country at large. The Federal government has assumed jurisdiction over it, and expended money, as appears from the admitted facts, for its improvement. It is one of the channels over which the commerce of the country passes, and this improvement was instituted for the purpose of increasing its power as one of the navigable streams of the country. It was undertaken in the interest of the commerce of the country. Was it ever intended that a few land owners bordering on one of the navigable streams of the country should be compelled to pay for an entire improvement in a river, the object of which is to benefit the public at large rather than the locality where the improvement is made? Here the contemplated improvement was one to widen the river in order that boats and vessels might pass up and down the river with greater facility,—one calculated to increase the navigable qualities of the river,—an enterprise wholly public in its nature. If one of the cities located on the banks of the Mississippi river should undertake to remove obstructions from that navigable stream of water to enable boats to run up and down the river with greater facility and pay for the improvement by special assessment on property fronting on the river, it would not, we apprehend, be contended that an assessment of that character could be sustained under the provisions of the statute above cited; and yet there is no substantial difference between the supposed case and the one under consideration. The proposed improvement has none of the elements of a local improvement, such as incorporated towns and cities have been in the habit of making by special assessment."

If riparian owners cannot be specially assessed to pay for the improvement of a navigable stream, *a fortiori* they cannot be required to surrender valuable property rights, without compensation, in furtherance of a scheme to improve one that is not navigable in its natural condition. Much time and labor have been spent by appellant in presenting reports

of surveys, maps and engineering schemes for the improvement of this river, which, if carried out, would render the river navigable. But all this is not pertinent to the issue. The question is whether the river was navigable in a state of nature, and not whether it can be made so by artificial means.

It is also contended that the Sanitary District act declared this river to be navigable. This contention is based on a sentence in section 24 of said act, as follows: "When such channel shall be completed, and the water turned therein, to the amount of 300,000 cubic feet of water per minute, the *same* is hereby declared a navigable stream." Appellant's contention, under this statute, is thus stated in its brief: "The *same* means that the water flowing in that channel is a navigable stream. The water so turned in was navigable in fact, and it does not lose its navigability in passing out of the artificial channel into the channel of the Desplaines river. The water is just as navigable one-half mile southwest of Joliet as it is one-half mile northeast of Joliet." The argument is based upon an erroneous construction of the word "*same*." That term refers to the channel of the sanitary district and has no reference to the water after it leaves the channel.

But even if the legislature had declared in unequivocal language, that the Desplaines river was navigable, as it did by the act of 1907, such declaration could not have the effect of depriving appellee of vested rights as riparian proprietor, if such rights exist. The general doctrine upon this question is well expressed by the Supreme Court of Kentucky in *Murray v. Preston*, 106 Ky., 561, (90 Am. St. Rep., 232,) as follows: "The first question is, what is the effect of the act of the legislature declaring this creek a navigable stream? The constitution of the State forbids private property being taken for public use without just compensation being previously made. If the creek was not a navigable stream when this act was passed it was the private property of the owners of the adjoining lands. If it was the private property of appellant within the boundary of his land, the legislature could not divest him of his rights by simply calling it a navigable stream when it was not one in fact. The rule on this subject is thus stated in *Cooley on Constitutional Limitations* (side p. 591): 'The question what is a navigable stream would seem to be a mixed question of law and fact, and though it is said that the legisla-

ture of the State may determine whether a stream shall be considered a public highway or not, yet if, in fact, it is not one the legislature cannot make it so by simple declaration, since if it is private property the legislature cannot appropriate it to a public use without providing for compensation.' ” And the same doctrine is announced in the following cases: *Walker v. Board of Public Works*, 16 Ohio, 540; *Morgan v. King*, 35 N. Y., 454; *Shenango Bridge Co. v. Paige*, 83 id., 178; *Martin v. People*, 5 Blackb., 35; *Olive v. State*, 86 Ala., 88; *People v. River Mill and Lumber Co.*, 107 Cal., 221; *Yates v. Milwaukee*, 10 Wall., 497; *Watkins v. Dorris*, 54 L. R. A., 199.

None of the legislative acts relied upon by the appellant were passed for the primary purpose of promoting deep water navigation from the lakes to the gulf by means of improving the channel of the Desplaines river. The various acts passed in the interest of the Illinois and Michigan canal, as well as the Sanitary District act, did not include any general scheme for the improvement of the Desplaines river. Up to this time no general plan for the deep waterway has been adopted, either by the State or the nation. Whether such enterprise will ever be attempted by either, separately or by the joint action of both, and, if such enterprise is entered upon, whether the plan will embrace the use of the old Illinois and Michigan canal or the sanitary district channel in connection with a part of the Chicago and Desplaines rivers or whether some new and entirely different channel will be adopted, are all legislative questions, with which the courts have no concern. Figuratively speaking, the waters have been much troubled on this subject, but so far neither the nation nor the State has legislated how they shall flow. What the future will see accomplished along these lines no one can know. It may be that when that future is unfolded it will bring a realization of the hopes of the most optimistic, and that the appearance of sea-going vessels plowing through the prairies of Illinois, laden with the people and products from the uttermost parts of the earth, will be as common as the now almost forgotten “prairie schooners” of 1849 were in those days. But if this transition is to occur,—if the powerful hands of the government are to lay hold of this gigantic enterprise,—they must do so with due regard to the sacred rights of every citizen, however humble and insignificant those rights may seem in contrast with the great public consummation.

What is a navigable stream is a question to which different courts have given different answers. In some of the States, where the lumber business was of great importance and the floating of saw logs an essential branch thereof, a stream that had the capacity for floating logs, though only for short periods in times of freshets, was held to be navigable. (*Brown v. Chadbourne*, 31 Me., 9; *Moore v. Sanborne*, 2 Mich., 519.) But these cases, and the reasons upon which they rest, were examined by this court in *Hubbard v. Bell*, 54 Ill., 110, and their authority expressly rejected. In discussing that question this court, on page 122, used the following language: "It is not enough that a stream is capable, during a period, in the aggregate, of from two to four weeks in the year, when it is swollen by the spring and autumn freshets, of carrying down its rapid course whatever may have been thrown upon its angry waters, to be borne at random over every impediment in the shape of dams or bridges which the hand of man has erected. To call such a stream navigable in any sense is a palpable misapplication of the term." The doctrine of this case has been re-affirmed by this court in *Schulte v. Warren*, *supra*, and on page 119 of the latter case this court approved the following definition of a navigable stream by Lord Hale in his treatise *De jure maris*: "A stream, to be navigable, must furnish 'a common passage for the king's people,' must be 'of common or public use for the carriage of boats and lighters,' must be capable of bearing up and floating vessels for the transportation of property conducted by the agency of man." And the same definition is also approved in *Joliet and Chicago Railroad Co. v. Healy*, 94 Ill., 416. In the *Schulte* case it was further said (p. 119): "A stream is navigable, in fact, only where it affords a channel for useful commerce and of practical utility to the public as such. The fact that there is water enough in places for row boats or small launches answering practically the same purpose, or that hunters and fishermen pass over the water with boats ordinarily used for that purpose, does not render the waters navigable."

A stream, to be navigable, must in its ordinary, natural condition furnish a highway over which commerce is or may be carried on in the customary modes in which such commerce is conducted by water. (Gould on Waters, sec. 34, and cases there cited.) Whether the stream in question is navigable is a question of fact, the burden of proving



which rests upon the party asserting it. (*Ligare v. Chicago, Madison and Northern Railroad Co.*, 166 Ill., 249.) To maintain this issue appellant with commendable industry has assembled every fact which appears to have even a remote bearing on the question and incorporated the evidence in the record. Research into historical data has been made and the result presented to the court. This class of evidence begins with the account of the first voyage of Marquette and Joliet, in 1673-74, as related by John Gilmary Shea in "Shea's Early Voyages up and down the Mississippi," published in 1700 by Burrow Bros. Excerpts from this publication were introduced, also copies of maps made by Marquette and Joliet showing the principal features of the country explored by them. Section 10 from a chapter from this book, entitled "The first voyage made by Father Marquette toward New Mexico, and how the idea thereof was conceived," reads as follows:

"Return of the Father and of the French.—After a month's navigation, while descending the Mississippi from the 42d to the 34th degree and beyond, and after preaching the gospel as well as I could to the nations that I met, we started on the 17th day of July from the village of the Akensea to retract our steps. We therefore re-ascended the Mississippi, which gives us much trouble in breasting its current. It is true that we leave it at about the 38th degree to enter another river, which greatly shortens our road and takes us with but little effort to the Lake of the Illinois. We have seen nothing like this river that we enter, as regards its fertility of soil, its prairie and woods, its cattle, elk, deer, wild oats, bustards, swans, parroquets, and even beaver. There are many small lakes and rivers. That on which we sailed is wide, deep and still for sixty-five leagues. In the spring and during part of the summer there is only one portage of half a league. We found on it a village of Illinois, Kaskaskia, which consists of seventy-four cabins. They received us very well and obliged me to promise that I would return and instruct them. One of the chiefs of this nation, with his young men, escorted us to the Lake of the Illinois, whence at last, at the end, we reached the bay Des Prantz, from which we had started at the beginning of June."

This account indicates a reasonable probability that Father Marquette went up the Mississippi river, turned into the Illinois, thence up the Illinois to the mouth of the Des-



plaines, and up that river to a point where a portage was made to the south branch of the Chicago river, thence into the Lake of Illinois, (Lake Michigan), and this probability is strengthened by the maps introduced, which show that these rivers, together with the portage between the Desplaines and the Chicago, were known at that time. The boats in which these voyages were made are described in the following passage: "We were not long in preparing all our equipment, although we were about to begin a voyage the duration of which we could not foresee. Indian corn, with some smoked meat, constituted all our provisions. With these we embarked,—Monsieur Jollyet and myself, with five men,—in two bark canoes, fully resolved to do and suffer everything for so glorious an undertaking."

A passage from "Indian Antiquities," by Schoolcraft, is introduced, which recites that in 1783 Jean Baptiste Perreault, a fur trader from Montreal, spent a year in Cahokia and returned by way of Chicago with a canoe and a barge loaded with furs. The passage referred to is as follows: "About the 15th of April the packs from Missouri arrived. Our bourgeois settled his accounts with M. Coteau and received seventy-four packs of furs. His retail store at Cahokia produced 500 Spanish dollars and 400 pounds of tobacco. We left Cahokia on the 4th of May for Mackinac. My directions were to pass by Chicago, having one barge and one canoe, and to await the arrival of M. Marchisseaux at Little Detroit, in Lake Michigan, he having gone by the way of Prairie des Chiens to terminate his business with the Sauks. After fourteen days' detention he arrived, and continuing our route we reached Mackinac the beginning of July, where I found myself at liberty."

A manuscript not very well authenticated was introduced, which shows that Hugh Heward, in May, 1790, made a voyage from Lake Michigan through the Chicago river and over the portage road to the Desplaines, and down the Desplaines and Illinois to some point (probably Kaskaskia) on the Mississippi river. This document records the fact that after passing over the rapids above the village of Mt. Julliette two of his comrades informed Heward that "there was so much danger they would not return with Heward." The character of the boats and cargo is not described, but neither could have been very heavy, since the boats and cargo were carried over the portage from the Chicago river to the Desplaines by Heward and his two com-

rades with the help of five Indians, whose services were paid for with two handfuls of powder.

There are other historical references to the route by way of the Chicago and Desplaines rivers to the Mississippi, but these are the only well authenticated voyages that were made during the first one hundred and fifty years after the discovery of the Desplaines river. The fact that during this long period only an occasional voyage was made under the guidance of a heroic adventurer or a religious zealot, who, in the language of Marquette, "feared no death and regarded no happiness greater than that of losing his life for the glory of Him who made us all," is not sufficient evidence to prove that the Desplaines river was, in fact, regarded as navigable by the great majority of the people who must have been acquainted with it during this period. It rather tends to show that the few who possessed the courage to brave the dangers incident to a voyage over the rocky rapids of the Desplaines were exceptional cases, and that the great body of the people living in the vicinity of this river did not regard the navigation of the river as reasonably safe and therefore made no use of it. There is not in this entire record a well authenticated instance in which a boat engaged in commerce navigated the waters of the Desplaines river. It seems pertinent to inquire, if the Desplaines river is navigable why has it not been navigated? If the Desplaines river was navigable, why did the State of Illinois spend \$10,000,000 in the construction of the Illinois and Michigan canal, which parallels the Desplaines river. The conclusion is irresistible that in the opinion of the legislature the Desplaines river was not only not navigable in its natural condition, but that the natural obstructions were such that it was cheaper to construct a navigable canal than to remove the difficulties out of the natural channel. Appellant's answer to the last question above stated is, that the Illinois and Michigan canal was extended beyond the point where it might have intersected the Desplaines river in order to obtain as large a grant of land as possible from the Federal government. This answer discredits the intelligence of Congress and reflects on the honor of the State. We are unwilling to believe that the State would have asked for, or that Congress would have granted, lands to aid in the building of a canal that was not needed. The Chicago river was used as a part of the canal at its northern end, and had it been practicable to

do so, it is reasonable to believe the Desplaines river would have been used at the other end.

A large number of witnesses testified, some from personal observation and others as experts, upon this issue. As might be expected, these witnesses testify to opposite opinions in regard to the navigability of this river. It is not practicable nor desirable to discuss this evidence in detail. Whatever may be thought of the preponderance of it one way or the other, it can have but little weight as against the uncontroverted fact that the river has never been used as a public highway for commerce. During the early part of the history of the Mississippi valley, and before railroad transportation came into general use, all of the navigable rivers in the settled portion of the country were extensively used. The necessities of the early settlers compelled them to use the means of transportation that nature afforded them. Before steamboats were in general use, farm products were floated down the Mississippi river and all of its tributaries in floatboats. The Sangamon, Illinois, Wabash and Ohio rivers were thus extensively used. Had it been possible to do so, it seems but reasonable that the Desplaines river would have been used in the same way by the early settlers, but the evidence of any such use is not found in this record. The evidence shows that as early as 1817 there was a well-beaten wagon road from the mouth of the Desplaines river to Chicago, over which boats and other loads were hauled by oxen and vehicles kept for that purpose by the French settlers at Chicago. The evidence of the existence of this road is found in a report by R. Graham and Joseph Phillips made to Hon. J. C. Calhoun, Secretary of War, and is dated "Kaskaskia, April 4, 1819." The testimony of the early settlers is, that they came in and went out of Chicago by wagon road. In 1836 the New York and Oswego Transportation Line advertised in the *Chicago American* of May 14, 1836, that goods would be transported from New York to St. Louis. One link in the line of transportation was by "wagons from Chicago to the head of navigation on the Illinois river," and in the same paper a passenger line was advertised from Chicago to Peoria, which was by a mail stage leaving Chicago daily for Peoria, making the trip of 170 miles in "from thirty to thirty-five hours by steamboats and stages,—stages from Chicago to Peru and steamboats from Peru to Peoria. Fare, the whole distance, \$11, and found on board the

boat. This line passes through Lockport, Juliet, Ottawa and Utica, to Peru." All of the witnesses who testified to the mode of transportation before the opening of the Illinois and Michigan canal, in 1848, testify to the general custom that prevailed along the line of the Desplaines river of hauling grain and other produce by wagon to Chicago, and some of them say that it was not uncommon in those days for wagons to go to Chicago from points as far south as Bloomington.

Appellant has introduced, for the purpose of comparison, descriptions of other rivers which have the same or similar natural obstructions that are found in the Desplaines river, notwithstanding which such other rivers have been held to be navigable. Evidence of this character was introduced in regard to the Mississippi, Fox, Wisconsin, Ohio, Kanawha, Cumberland, Missouri, Gasconade, Allegheny, Tennessee, Sangamon, Columbia and Snake rivers. To review all this evidence would extend this discussion to unreasonable bounds. We are not strongly impressed with the line of reasoning that is based upon this class of evidence. There are no two rivers exactly alike, and it will be found that most, if not all, of the rivers referred to as standards of comparison contain a long strip of navigable water, which is of sufficient length and importance to justify commerce in devising methods to overcome the natural obstructions. This is not true of the Desplaines river. There are no navigable portions of this river of sufficient length to make navigation profitable thereon. After the most careful consideration of this question we are of the opinion that the Desplaines river in its natural condition is not a navigable stream, and that the rights of parties to this suit must be determined upon that basis.

**THE VALIDITY OF THE CONTRACTS.**—*The flowage contract.*—The third ground upon which appellant rests its right to an injunction is the alleged invalidity of certain contracts entered into between the commissioners of the Illinois and Michigan canal and certain parties who have transferred all their interest in said contracts to appellee. In order to properly understand the questions involved in regard to these contracts it will be necessary to state some facts which we have not heretofore referred to.

At the point where the dam is located the Illinois and Michigan canal parallels the Desplaines river. The two water-courses are separated at this point by an artificial

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embankment erected by the State in the construction of the canal. The canal is on the right side of the river, and still to the west of the canal arise steep bluffs, which are known as "Dresden Heights." On the left side of the river the triangle of land between it and the Kankakee is low and flat. The canal is elevated by means of an artificial embankment. This embankment has a trench in the top, carrying the Illinois and Michigan canal. The left-hand side of the embankment slopes toward the Desplaines river. On this side of the canal there is a level space a few feet wide at the crest of the embankment, which is called the tow-path. The sloping embankment of the canal extends up the canal. Appellee's purpose is to construct a dam across the Desplaines river so that the right-hand end thereof will rest against the sloping side of the canal embankment, thus forming a pool of water above the dam which will at its extreme height be twenty-four feet above low-water mark in the Desplaines river at the dam. The pool of water thus formed will extend several miles up the river, one side of which will rest against the canal embankment. At the point where the dam is located the canal embankment is approximately twenty-four feet above the level of the water in the river. The base of the canal at this point is about seventy feet in width, and the left bank next to the river is from twelve to fourteen feet in width at the top. From the base of the canal the ground slopes gradually to the river, which is about seven hundred feet distant. Appellee's intention is to raise the water in ordinary stages to an elevation about seven feet lower than the top of the tow-path bank. About one-half mile up the river from the dam is the southern extremity of a narrow strip of land between the canal bank and the river, which is designated in the record as the "sixteen-acre tract." This sixteen-acre tract is low and marshy, and is bounded on the one side by the Desplaines river and by the canal on the other. It is in section 31, township 34, north, range 9, east of the third principal meridian, in Will county, and is a part of the lands granted by Congress to the State to aid in the building of the canal and still belonged to the State when the flowage contract was made. The effect of constructing this dam will be to flood this sixteen-acre tract.

Appellant contends that the contract executed September 2, 1904, by the canal commissioners to Harold F. Griswold designated in the record as "the flowage contract," is void

and should be so declared by the court. This contract recites, that whereas the said Griswold, party of the second part, claims to be a riparian owner along the Desplaines and Illinois rivers, in Grundy and Will counties, and is as such riparian owner, about to improve the Desplaines river by the construction of a dam and other works across the mouth of said river, with a crest of such height that the pool formed thereby will be on a level with the waters of Lake Joliet, and is about to improve the Illinois river by deepening the channel of said river in section 25, township 34, north, range 8, east; and whereas, the State of Illinois is a riparian owner at different points on the Desplaines and Illinois rivers within the territory covered by this contract, and is the owner of certain described parcels of land under the control of the canal commissioners and which are not connected with a water power upon the Illinois and Michigan canal, which said riparian rights of the State have never produced a revenue, and the land is swampy, partially covered with water, and said lands are so situated that they cannot be made valuable by the State to create water power, and the party of the second part is desirous of obtaining the right to use, overflow and damage said lands, (not, however, in a manner to interfere with navigation on the Illinois and Michigan canal,) so much of the property of the State as may be necessary in the construction of said dam and other works in the improvement of said Desplaines river and in the deepening of the channel of the Illinois river. In consideration of these premises and the sum of \$2200, the receipt of which was acknowledged, the parties entered into a contract, the substance of which is as follows:

The said contract purports to give the consent of the commissioners of the Illinois and Michigan canal to the construction of a dam across the mouth of the Desplaines river, with a crest at an elevation not to exceed minus 73.2 Chicago datum, which dam shall not back the water beyond the northern limits of Lake Joliet, and to deepen the channel of the Illinois river at certain points; and gives the rights and authority to Griswold to flow the ninety-foot reserve strip through certain sections of land by the canal bank, and to flow such of the lands in the north fraction of section 31, township 34, as lie south of the ninety-foot strip along the tow-path side of the Illinois and Michigan canal, where the same may be overflowed by reason of



the construction of said dam, together with a right to flow the water up against the tow-path bank of the canal, subject to certain conditions and specifications therein provided, intended to protect and preserve the canal and the tow-path bank thereof. The contract authorizes Griswold to attach one end of the dam to the tow-path bank of the canal, but not so as to interfere in any manner with the use of said tow-path in connection with said canal. The contract also authorizes Griswold to excavate in and remove so much of the Kankakee feeder (an abandoned feeder of the Illinois and Michigan canal) as may be necessary to discharge the waters of the Desplaines river through said feeder in a proper manner, and to remove the old aqueduct piers belonging to said feeder in the Desplaines river. The contract further provides that Griswold shall have the right to turn and avert water from the Desplaines river into the Kankakee river through a certain stream of water called the "Kankakee cut-off," through and over the Kankakee feeder and the ninety-foot strip on each side of the feeder, in section 25, township 33, range 9, and to construct controlling gates on the banks of said feeder for flood protection from the Kankakee river. Clause 6 of said agreement is as follows: It shall be the duty of said party of the second part, subject to the direction of the canal commissioners or other officer or agent, as hereinafter indicated, to raise the tow-path or bank or the Illinois and Michigan canal from its present height not less than two feet, and to any additional height that may be necessary to prevent overflow, and to *perpetually* thereafter maintain the same in good condition. The raising of said tow-path shall extend from the point in said Grundy county where the dam or other structure of said party of the second part intercepts said tow-path bank to lock No. 7, in section 17, township 34, north, range 9, east of the third principal meridian, and when raised, the width of the top of the tow-path bank shall conform to the width of the tow-path as it exists at the present time." By the eighth clause of said contract permission is given to Griswold to use so much of the gravel or other material lying along the canal and belonging thereto as may be necessary to raise the tow-path bank as is provided in the sixth clause, such material, however, to be taken from places indicated or approved by the superintendent of the canal. Permission is given to enter upon the lands and premises of the State for the purpose of con-



structing said dam and raising the tow-path and for making necessary repairs to the same. Griswold covenants to raise certain buildings owned by the State and used in connection with the canal to a level with the tow-path, as provided in paragraph 6 of said contract, and to provide two acres of land to be used by the State as a garden in connection with said buildings. It is provided and stipulated that all of the work to be done under said contract which shall affect the canal property or interest shall be done under the supervision of and to the satisfaction of the canal commissioners or other duly authorized agents, and not otherwise, and that such work, when completed, shall at all times be kept and maintained by said Griswold under a like supervision and approval of the canal commissioners, and that all costs of inspection shall be borne by said Griswold, who is, under the terms of said agreement, to be held responsible for all damages that may be sustained by the State or the canal commissioners, or the persons or property of persons using the Illinois and Michigan canal, or that may be occasioned by the construction of the works contemplated to be done or in the subsequent repair and maintenance thereof under said contract. Said contract, and all the provisions thereof, are by its terms made obligatory upon the successors and assigns of said Griswold.

The Kankakee feeder is an artificial channel which was constructed upon the right side of the Kankakee river, commencing a few miles above the confluence of the Kankakee and Desplaines rivers and running in a northwesterly direction, almost parallel with the Kankakee river, to a point where the feeder intersects the Desplaines river, a distance of some three-quarters of a mile above the mouth of the Desplaines. The purpose of this feeder was to supply water to the Illinois and Michigan canal prior to the lowering of its summit level, after which the canal was supplied with water from Lake Michigan. The Illinois and Michigan canal being on the opposite side of the Desplaines river from the Kankakee feeder, it was necessary to cross the Desplaines river with this feeder in order to deliver the water into the canal. The aqueduct and piers referred to in the flowage contract, and which Griswold is given the right to excavate and remove, are the works that were placed in the Desplaines river for the purpose of carrying the water in the Kankakee feeder across the Desplaines river to the canal. As already stated, this feeder was ren-

dered unnecessary after the summit level of the canal was lowered by the city of Chicago, so that the so-called Kankakee feeder has not been used for nearly twenty years prior to the commencement of this suit. It is marked "abandoned" on the map made under the direction of J. W. Woermann, United States assistant engineer. The evidence shows that the Santa Fe and Chicago and Alton railroads cross the Kankakee feeder and the ninety-foot reserve strip on either side thereof, and that the channel is filled up by the railroad embankments at the point where they cross the feeder. The Kankakee cut-off is an artificial channel connecting the Kankakee and Desplaines rivers. It taps the Kankakee river at a point near the section line between sections 5 and 6, township 33, north, range 9, east, and extends north a distance of two miles and intersects the Desplaines river about two miles above its mouth. The Kankakee cut-off crosses the Kankakee feeder near the center of the south line of section 5.

Appellant's contention in reference to this flowage contract is, that it is, in effect, a sale of the interest in the lands affected thereby, and as such it is void under the statute hereinafter referred to, because it was not made at a public offering after giving the statutory notice. It will be observed that this flowage contract is not limited to twenty years or any other specified term. The absence of such limit, and the provision in clause 6 which we have quoted above regarding the agreement of the party of the second part to perpetually maintain the tow-path or the bank of the canal in repair, form the basis for the contention that the contract is, in effect, a sale of the interest in the lands to be flooded. Numerous authorities are cited by appellant to the effect that an agreement for the perpetual flowage is, in effect, a sale of an interest in the land and a right of perpetual possession. Among the cases so holding in this State are *Woodward v. Seely*, 11 Ill., 157, and *Wilmington Water Power Co. v. Evans*, 166 id., 548. The authorities are numerous in other States to the same effect and the soundness of the proposition cannot be questioned.

The act of March 27, 1874, (Hurd's Stat., 1908, p. 220, *et seq.*), under which all of the contracts in question were made, after providing in section 1 to 7 for the appointment and organization of the board of canal commissioners, by section 8 defines the powers and duties of the said board. Said section 8 reads, in part, as follows:

"Sec. 8. Said commissioners shall have control and management of the Illinois and Michigan canal, including its feeders, basins and appurtenances, and the property thereto belonging, and all locks and dams and other improvements of the navigation of the Illinois and Little Wabash rivers, and shall have authority: \* \* \*

"*Fourth*—To sell and dispose of any machinery, fixtures, stone, debris, material or personal property unnecessary for the proper management, construction, repair or use of said canal, locks, dams, and other improvements.

"*Fifth*—To lease from time to time any of the canal lands or lots owned by the State: *Provided*, no lease shall be for a period exceeding twenty years.

"*Sixth*—To lease from time to time, to the highest bidder therefor, any water power and lands or lots connected therewith. Before any such lease shall be made, at least thirty days' public notice of the intended letting shall be given by publication in some newspaper published in the neighborhood, and such other notice as the commissioners shall deem best. The commissioners shall have power to require that bids be accompanied by security and may reject all bids not satisfactory to them, and re-advertise until they shall receive satisfactory bids. No lease shall be for a period exceeding twenty years, but the commissioners may provide for the extension of any lease from time to time, not exceeding twenty years at any one time, at a rent to be fixed by an appraisal, to be made by three disinterested appraisers to be appointed by the Governor, and such appraisal shall be subject to the approval of the commissioners. All leases of water power and extension thereof shall be subject to the right of the commissioners to resume, without compensation to the lessee, the use of any such water power for the purpose of the canal, and also wholly to abandon or destroy the work by the construction of which the water privilege shall have been created, whenever, in the opinion of the legislature, such work shall cease to be advantageous to the State.

"*Seventh*—To the lease from time to time to the highest and best bidder (after publishing notice in some newspaper published in the county where the ice privilege to be leased may be,) in sections not exceeding one thousand feet, lineal measure, upon such terms, as not to interfere with the proper use and management of the canal, the right to take and harvest ice therefrom, or from any of its feeders, ba-

sins and appurtenances, and to prohibit all persons from taking and harvesting ice therefrom without such lease: *Provided*, no such lease shall be for a longer time than twenty years.

*"Eighth*—To sell and convey, whenever in their judgment the interest of the State will be promoted thereby, any canal lands or lots now owned by the State, and any riparian rights in and along the Desplaines river: *Provided*, they shall not sell any lands or any portion of the ninety-foot strip along the canal which are now utilized in connection with the use of the water power upon the said canal or which will prevent or interfere with the proper use and operation of the said canal as a waterway. But before making any such sale they shall obtain the approval of the Governor thereto, and to the time, place and manner of making the same: *Provided*, that before any such sale shall be made thirty days' previous notice thereof shall be given in some newspaper published in the county where such land, lots or riparian rights are situated. And said land, lots or riparian rights shall be sold at public auction to the highest and best bidder. *Provided*, that any or all such bids may be rejected if, in the judgment of the canal commissioners the interests of the State seem to require it.

*"Ninth*—To execute in due form and deliver any conveyance that may be necessary to comply with the conditions of any bond, contract or agreement heretofore made by those lawfully authorized to sell any of the real estate known as canal lands, where the purchaser shall have complied with the conditions of such bond, contract or agreement, and the commissioners are satisfied that he is justly entitled to such conveyance."

It will be seen that under the second proviso of clause 8 of section 8 of the statute above quoted it is required that before any sale of "canal lands or lots" can be made by the canal commissioners it is necessary that they obtain the approval of the Governor and advertise such sale for thirty days in some newspaper published in the county where such lands, lots or riparian rights are situated, and that such sale can only be made at public auction to the highest and best bidder. If the flowage contract was a sale of canal lands or lots or riparian rights, then, clearly, under this statute such sale would be void, since there was no attempt on the part of the canal commissioners to comply with clause 8 in relation to the sale of canal lands and lots. By careful at-

tention to section 8 and the several clauses thereof it will be found that the powers of the canal commissioners may be divided into two classes, as follows:

(1) Powers which may be exercised without notice, which are: (a) All the general powers of the commissioners given by the first sentence in section 8; (b) the power to sell and dispose of personal property, as provided in clause 4; (c) to lease for a period not exceeding twenty years any of the canal lands and lots owned by the State.

(2) Powers which can only be exercised after public notice and at public auction, which are: (a) The power to lease water power and lands and lots connected therewith, as provided in clause 6 of said section 8; (b) the power to lease the right to harvest and take ice from the canal, as is provided in clause 7; (c) the power to sell and convey canal lands and lots and riparian rights in the Desplaines river, as provided in clause 8.

The commissioners have no power to sell any land or any portion of the ninety-foot strip along the canal which is now utilized in connection with the use of water power, either at public or private sale, with or without notice.

Appellant contends that this flowage contract was a perpetual license to flow certain lands belonging to the State, and is void because a perpetual license is, in effect, a sale of an interest in the land, and regarding the contract as a sale, it cannot be upheld, for the reason that the statute in respect to sales was not complied with. There is no language in the contract showing that the parties to it intended it as a sale of any interest in the lands described therein. To give it the effect of a sale would be obviously against the intention of the parties to the contract.

Appellant contends that the contract is a sale because of the use of the word "perpetually" in connection with the duty of Griswold to keep the tow-path bank in repair. If this contract had by its terms granted the rights and privileges therein mentioned for a term of twenty years it would clearly be within the powers of the commissioners which are enumerated under division "c" of class 1, which are granted by the fifth clause of section 8 of the statute, unless the flowage contract should be held to be a lease of "water power and lands and lots connected therewith." If it is possible to do so, such a construction of the contract should be given as makes the contract valid rather than one which destroys it. No time having been stated in the contract it

must be inferred that it was made with reference to the statute, and the contract should be read in the light of the statute under which the commissioners were acting. It is a well established rule that where one attempts to grant a greater estate than he has, the conveyance will be effective to pass what he has although the grant may be inoperative as to the larger estate. Disregarding the word "perpetually," it could not reasonably be contended that the lease extended longer than the term authorized by the statute. It will be noted that the word "perpetually" is not used to define the duration of the rights granted to Griswold, but it occurs in a clause defining the obligations assumed by Griswold. But in our opinion the word "perpetually," as used in this contract, should not be construed as meaning "forever." The question here is, what did the parties mean and how did they understand the term? The word "perpetually" does not always mean "forever." (*De-Florez v. Reynolds*, 8 Fed. Rep. 334; *State v. Payne*, 31 S. W. Rep. 797.) This court held in *People v. Chicago Telephone Co.* 220 Ill. 238, and *People v. Central Union Telephone Co.* 232 id. 260, that a grant to a corporation of a franchise without any limitation as to duration will not be held as a grant in perpetuity but will be limited to the life of the corporation to which it was granted; and the same rule was announced by the Supreme Court of the United States in *Blair v. City of Chicago*, 201 U. S. 400. In the case last above cited, on page 485, the Supreme Court of the United States said: "We cannot agree that the duration of these permits would be in perpetuity because of the fact that no time was named in them. The extension into Lake View was part of the north side railway system, which by the terms of the grants from the city were limited to twenty-five years, and no longer. There certainly could be no intention, in granting these permits from the supervisors as extensions of the system, to make perpetual grants when the right of user of the main part of the line was expressly limited to twenty-five years, and their inference would be, that in extending this part of the system so as to make a portion of that already granted, such grants were to be for the same term as those already made."

Reading the statute, which authorized the canal commissioners to enter into this contract for a term of twenty years, in connection with the language of the instrument, and construing the word "perpetually" in view of the statute and the context of the contract, we think it means that the rights granted



to Griswold are for twenty years, and that his obligation to maintain the tow-path bank in repair is co-terminous with the rights granted to him.

That this flowage contract was not understood by the parties thereto as conveying a perpetual right to Griswold to flow the property of the State therein described is shown by the fact that on January 6, 1905, the canal commissioners sold and conveyed to Griswold the parcel of land known as the sixteen-acre tract. This sixteen-acre tract is embraced in the flowage contract. If by such flowage contract Griswold obtained the right to flow said sixteen-acre tract in perpetuity, then there would have been no reason for his paying \$500 additional for a deed to said tract. This transaction shows that the parties themselves did not regard the flowage contract as a sale of an interest in the land itself. On the same day that the flowage contract was executed, and as a part of the same transaction between the canal commissioners and Griswold, a lease was executed of the ninety-foot reserve strip along the tow-path of the canal, describing said ninety-foot strip in the same way that it is described in the flowage contract, which said lease is for a term of twenty years from said second day of September, 1904. The lease was a general lease, in consideration of \$500. It is not stated in said lease what use is to be made of said ninety-foot reserve strip.

It is a familiar rule of construction that where different instruments are executed between the same parties and relating to the same subject matter, all of the instruments should be construed together in determining the real intention of the parties. This rule has often been applied by this court. (*Canterberry v. Miller*, 76 Ill. 355; *Wilson v. Roots*, 119 id. 379; *Gardt v. Brown*, 113 id. 475.) Applying this rule to the flowage contract and the lease of the ninety-foot strip, which also included the sixteen-acre tract, we have this situation: The canal commissioners leased to Griswold certain portions of the ninety-foot reserve strip, the sixteen-acre tract and certain privileges in regard to the Kankakee feeder for a term of twenty years. At the same time the flowage contract was executed, authorizing Griswold to flow the identical lands, as far as the ninety-foot strip and the sixteen-acre tract are concerned, as are mentioned in the twenty-year lease. Construing both these instruments together and as constituting parts of an entire transaction, there is little room to doubt that the parties intended that the flowage contract



would terminate with the lease upon the same premises. The execution of the lease upon the ninety-foot strip was not an unusual transaction. The evidence shows that for many years the State has derived a very substantial revenue from leases of the ninety-foot strip. The report of the canal commissioners for 1895 and 1896 shows that approximately \$10,000 was received as rentals from the ninety-foot reserve strip. There is clear authority under the statute for making such leases, provided the lease shall not extend beyond twenty years, and provided also that where the lease is connected with a water power it can only be made in the manner provided in clause 6 of section 8 of the statute.

Appellant contends that the flowage contract and the lease constitute a water power lease, within the meaning of that term as it is used in clause 6 of section 8 of the statute. Appellant's position is, that since the statute forbids the leasing of "any water power and lands or lots connected therewith," without complying with certain conditions as to advertising and appraising, and since the purpose of Griswold in obtaining these contracts was that he might use the demised premises in connection with the water power which he was intending to develop in the Desplaines river, therefore the lands and lots were connected with a water power and could not be leased without complying with the conditions of the statute, even though the water power in connection with which the premises were to be used did not belong to the State and had no connection whatever with the Illinois and Michigan canal. The fallacy of this contention is obvious. The "water power and lands or lots connected therewith," referred to in the sixth clause of section 8 of the statute, and which the canal commissioners cannot lease except by complying with the conditions imposed by the statute, are clearly the water power in the canal itself and the lands and lots connected therewith, which the State owns and which the canal commissioners are authorized to lease. It cannot be supposed that the legislature intended to give the canal commissioners the right to lease water power which the State did not own and over which it had no control whatever. The language of the sixth clause which authorizes the canal commissioners "to resume, without compensation to the lessee, the use of any such water power for the purpose of the canal, and also wholly to abandon or destroy the work by the construction of which the water privilege shall have been created," clearly shows that the water power which the com-

missioners had the power to lease was a water power which could be abandoned and the use of the water "resumed" whenever, "in the opinion of the legislature, said work shall cease to be advantageous to the State." There can be no doubt, it seems to us, of the meaning of this statute. It means that if a water power on the canal was leased and the drawing off of the water was found to interfere with the use of the canal, the commissioners would have the power to cancel the lease and "resume" the use of the water for canal purposes without paying any compensation or damages to the lessee in consequence of such resumption by the State. As we have sought to show in our discussion of the question relating to the title of the State to the bed of the Desplaines river, appellee owns or controls the lands, upon both sides of the river, at the place where the dam is located. The State owned no portion of the land upon which the dam was located, in the bed of the river or on either side thereof, except the tow-path bank, to which one end of the dam was to be joined. There is therefore no basis for the argument that the flowage contract and the lease were void because they were connected with a water power privilege belonging to the State. No one would seriously contend that the owner of a farm on a river which might be affected by the construction of a dam below it would sell a water power which he did not own, simply by consenting to the flowage of his lands located above the dam. The lands embraced in the flowage contract and the lease were not used in connection with any water power on the canal. Appellee did not obtain its right to build the dam from the State, but this right, as we have seen, existed as an incident to its ownership of the land, on both sides of the river, at the place of its location.

There is a provision in the lease of September 2, 1904, which we are considering as a part of the transaction resulting in the execution of the flowage contract, which provides for a re-leasing at the expiration of the term or a renewal of the lease, provided the lessee is willing to pay as much as anyone else for the premises or an amount to be fixed by appraisement, but which should not, in any event, be less than the amount fixed in this lease. Appellant contends that the covenant for the renewal of the lease for twenty years longer was part and parcel of the leasing contract itself, which, being so construed, made the lease, in effect, a lease for forty years, which renders it void under the statute. The power of the commissioners to provide for the renewal of

leases from time to time, not exceeding twenty years at any one time, at a rental to be fixed by appraisement, is conferred by clause 6 of section 8, and is limited to leases of "water power and lands or lots connected therewith," and has no reference to leases made by private treaty of "canal lands or lots owned by the State," which are authorized to be made under clause 5 of section 8. The lease itself having been made under the fifth clause of section 8, the clause providing for the renewal for another term (provided for in clause 6) was improperly included in the lease. There is no warrant in the statute for inserting such provision in any leases other than those made of "water power and lands or lots connected therewith," under clause 6. Statutes delegating powers to public officers must be strictly construed, and all parties interested must look to the statute for a grant of power. (*Diederich v. Rose*, 228 Ill. 610, and cases there cited.) There being no statutory power in the commissioners to enter into the renewal provision in this lease, it necessarily follows that such provision must be held void.

But we are unable to concur in appellant's contention that the invalidity of this clause renders the entire contract void. It does not present a case where a part of an entire consideration for the promise or agreement, or a part of an entire promise, is illegal and void. The lease is a complete contract in all respects, obligating the lessee to pay the entire consideration for the lease for a term of twenty years. The clause relating to the renewal of the lease for twenty years more is an independent and severable covenant, which in no way affects the validity of the lease for a term of twenty years, as therein provided. The rule upon this subject is, that if a contract is made, consisting of two or more covenants, upon a valuable and legal consideration, and one of the covenants is illegal and the other is legal, if the covenants are so distinct that that which is legal may be severed from that which is illegal, so that each covenant may be considered as a distinct contract, the legal covenant can be enforced and that which is illegal disregarded. (Page on Contracts, sec. 509; *Corcoran v. Lehigh Coal Co.* 138 Ill. 390.) In our opinion the lease in question falls under the rule above announced, and should be read and enforced as though the renewal clause was not in it.

*The deed to the sixteen-acre tract.*—On January 6, 1905, the canal commissioners made a quit-claim deed to this sixteen-acre tract to Harold F. Griswold, and appellee has suc-

ceeded to Griswold's title. Appellant contends that the canal trustees had no authority to execute the deed conveying this sixteen-acre tract to Griswold, and that, the deed being void, the title to said tract is still in the State, the protection of which will warrant a court of equity in enjoining the construction of the proposed dam. The charge made in the bill upon which the conclusion of invalidity is predicated is, that the premises conveyed were lands and lots connected with a water power privilege. The canal commissioners not being authorized by the statute to sell and convey water power privileges, or lands and lots connected therewith, it is sought to avoid this sale on that ground. The charge thus made in the bill is apparently abandoned in the briefs, but if it had not been so abandoned we do not regard the position as tenable. The need is a conveyance to a low, marshy piece of land which the State owned, on the shore of the Desplaines river. While, as we have already seen, the conveyance of this strip carried the title to the thread of the stream, still there is not now, and never has been, any water power developed in the river opposite this strip of land. Besides, we have sought to show in our consideration of the flowage contract that the water power which the canal commissioners were prohibited from selling was water power connected with the canal itself. The evidence shows that prior to the sale the canal commissioners applied to the Hon. Richard Yates, then Governor of the State, for his approval of the sale, and after such approval was given the sale was duly advertised in the manner and for the length of time required by the statute and the land sold to Harold T. Griswold for \$500, he being the highest and best bidder, and that said consideration was paid by the purchaser and a deed executed in pursuance of the sale. There is no claim that there was any fraud or collusion between the agents of the State and the purchaser at this sale. There is no reason to believe that the consideration was inadequate. This land had been carried by the canal commissioners on their books at an appraisalment of \$408 and had not been sold, presumably because no one could be found willing to pay the appraised value for it. After holding it more than fifty years it was sold, as above stated, for \$500.

The principal reason urged in appellant's brief why this deed should be declared void is, that the sale was not made by the commissioners in person but by a third party who acted at the request of the commissioners. This objection,

it will be seen, is not stated in the bill. But even if this point were properly pleaded and proven, it would amount to nothing more than a mere irregularity, which would not justify a court of equity in declaring the sale void, in the absence of any circumstances showing that the rights of the State had been prejudiced thereby. The power to make the sale is expressly vested by the statute in the canal commissioners. They sold the land in accordance with the formalities required by the statutes and executed a deed to the purchaser. The State received and retained the purchase money and has not offered to return any part of it. The State was, in legal contemplation, the grantor in the deed through its lawfully constituted agents. In *Gunnell v. Cockerill*, 79 Ill. 79, and *McHany v. Schenk*, 88 id. 357, it was held that a sale made by an attorney of a mortgage, under a power authorizing the mortgagee to sell, was a mere irregularity, which would not affect the rights of innocent third parties who might afterwards acquire the title.

At the time of the sale and conveyance of the sixteen-acre tract to Griswold appellee had no connection either with the land or with Griswold. It was not until November, 1906, that appellee succeeded to Griswold's title to this land. The State took no steps to avoid the sale while the title was in the original purchaser. The records of the county exhibited a clear and unquestionable title in appellee's grantor. The irregularity complained of did not appear of record. Under these circumstances it would be a perversion of equitable principles to permit the State to have this deed declared void because of the irregularity complained of. In our opinion the deed is a valid conveyance of all interest the State then owned in the sixteen-acre tract.

*The Kankakee feeder lease.*—The Kankakee feeder has already been briefly described. It was constructed about the time the canal was completed. It was originally a navigable canal, forty feet wide at the top and twenty-six feet at the bottom, with a depth of four feet, except at its mouth, where it was five feet deep. Its purpose was to supply the canal, with which it connected, with water brought down from the Kankakee river. A wooden aqueduct resting on stone piers carried the water in the feeder over the Desplaines river to the right bank, near which the feeder flowed, into the Illinois and Michigan canal. This feeder has not been used since the canal was deepened so as to obtain a sufficient water supply from Lake Michigan. The right to remove

what remained of the rock piers in the Desplaines river and to excavate the embankment of the feeder on the sixteen-acre tract north of the river and south of the canal so as to discharge the waters through section 31 in the proper manner was granted by the canal commissioners by the third clause of the flowage contract, and was included in the lease of September 2, 1904, which have already had our consideration. On August 8, 1905, another lease was executed by the canal commissioners to Griswold, purporting to lease to him for twenty years all rights which the State had, under the control of the canal commissioners, to divert the water of the Kankakee river into the Kankakee feeder and to discharge the same into the Desplaines river in said section 31, together with the right to restore the dam across the Kankakee river, and such right as the State had to construct, at each end of the feeder, suitable gates to control the water of the Kankakee river through such feeder, and to enter upon the Kankakee feeder for the purpose of repairing the banks thereof,—all of which rights were granted subject to the rights of the Atchison, Topeka and Santa Fe Railroad Company and the Chicago and Alton Railroad Company, both of which have solid embankments across the feeder and the ninety-foot strip on the side thereof. Said lease gave to Griswold the option of abandoning the premises at any time after five years by giving notice and restoring the feeder to its present condition, if required so to do. Said lease also provided that the canal commissioners might cancel the lease at any time, “whenever, in the judgment of the canal commissioners or other proper officers of the State having charge of canal property, they shall deem the interest of the State required it to re-possess and use the property for State purposes.” Said lease was made in consideration of \$150 per annum, payable on the tenth day of August, 1905, and on the tenth day of August in each and every year of said term. The lease also contained a renewal clause similar to that already discussed in reference to the lease of September 2, 1904. On November 27, 1907, the legislature adopted the following joint resolution:

“Whereas, the canal commissioners appointed under and by virtue of ‘An act to revise the law in relation to the Illinois and Michigan canal and for the improvement of the Illinois and Little Wabash rivers,’ approved March 27, 1874, in force July 1, 1874, have at various times heretofore executed leases of water power and water privileges to private individuals



and corporations, under and by virtue of the powers granted to said commissioners by section 8 of the above entitled act, and that among the said leases were certain alleged leases or agreements to Harold T. Griswold, dated September 2, A. D. 1904, purporting to grant and convey certain rights and privileges in and to the waters and water power of the Des-plaines and Kankakee rivers; and whereas, the said Harold T. Griswold or his assignees, by virtue of said alleged leases or agreements, are building and constructing certain dams, controlling works, locks and other obstructions in and across said streams, which, in the opinion of this General Assembly, are destructive of the navigation of said streams and to the disadvantage of the State of Illinois; and whereas, the sixth clause of section 3 (8) of said act provides, among other things, as follows: 'All leases of water power and extensions thereof shall be subject to the right of the commissioners to resume, without compensation to the lessee, the use of any such water power for the purposes of the canal, and also wholly to abandon or destroy the work by the construction of which the water privilege shall have been created, whenever, in the opinion of the legislature, such work shall cease to be advantageous to the State'; and whereas, the construction of such dams, controlling works, locks and other obstructions being erected and constructed by the said Harold T. Griswold or his assigns have ceased to be advantageous to the State, and that such water power and water privileges purporting to have been granted in and by virtue of said alleged leases or agreements are necessary for the purpose of the canal; therefore be it

*"Resolved by the House of Representatives, the Senate concurring therein,* That the said canal commissioners are hereby empowered and directed to cancel and annul said alleged leases or agreements and any and all extensions thereof, and to resume all such water power and water privileges therein purported to have been granted to the said Harold T. Griswold by the said canal commissioners on September 2, A. D. 1904, and that said water power and water privileges be restored for the purpose of the canal, and that all such dams, controlling works, locks and other obstructions therein existing for the purpose of creating such water power and water privileges be forthwith abandoned and destroyed by such canal commissioners."

Appellant contends that the adoption of this resolution had the effect of canceling this lease, and assigns two rea-



sons therefor: (1) Because the legislature is the "proper officers of the State in charge of canal property," within the meaning of the language of the lease whereby the right to cancel is reversed; (2) that said contract is a lease of water power, and that the State had the right, under the statute, to resume the use of the water and cancel the lease "whenever, in the opinion of the legislature," it was advantageous to the State to do so. Neither of these contentions can be sustained. The clause in the lease reserving the right to cancel it to "the canal commissioners or other proper officers of the State at such time having charge of canal property," means that the canal commissioners, or such other officers or agents as the State may designate by law to have charge of the canal properties instead of the canal commissioners, shall exercise the right of cancellation. If the State should abolish the board of canal commissioners and create some other agency to have charge of canal property, such other substituted agency could probably exercise the right of cancellation. The right to declare this contract at an end by one party thereto without the consent of the other party should be strictly construed, and so long as the State continues to board of canal commissioners in charge of canal property they are the only officers who can exercise this reserve right. The right under the contract does not arise until in the judgment of the canal commissioners "the interest of the State requires it to re-possess and use such property for State purposes." The discretion or judgment to be exercised, under the terms of the agreement, by the canal commissioners cannot be exercised by other State officials in another department of the State government. The second ground is equally untenable. This lease is not a water power lease, within the meaning of the statute. We have already expressed our views as to the meaning of water power leases, and for the reasons heretofore given appellant's second point cannot be sustained. If this contract was a water power lease, or lands and lots connected therewith, it would be void for other reasons, regardless of the legislature resolution.

There is still another reason why this lease is not affected by the joint resolution. It will be seen that the resolution is directed against certain leases made to Harold T. Griswold on September 2, 1904. Apparently this resolution refers to the flowage contract, the lease of the ninety-foot strip and the pole lease, which were the only contracts

executed between the canal commissioners and Griswold on that day. The Kankakee feeder lease was executed August 8, 1905, and therefore does not come within the purview of the joint resolution. The observations which we have heretofore made in reference to the renewal clause will apply to appellant's objection based on that clause in the lease now under consideration.

Appellant contends further that this lease is void because the Kankakee feeder is an integral part of the canal, and that the commissioners, under no circumstances, have any power to lease the canal itself or any of its parts. Undoubtedly this view is sound as applied to leases which would interfere with the uses of the canal for navigation purposes. All the powers of the canal commissioners should be exercised in such way as to promote the object for which the canal was constructed. All of the powers granted to the canal commissioners have been carefully safeguarded, so that their exercise would promote, and not obstruct or defeat, the primary object the State had in view in lending its generous patronage to this great public enterprise. The Kankakee feeder was originally a necessary part of the canal. It was used not only to supply the canal with necessary water, but the feeder was also used as a navigable canal, through which boats passed back and forth between the Kankakee river and the Illinois and Michigan canal. As already pointed out, about the year 1888 the use of this feeder was discontinued. The dam in the Kankakee river below the head of the canal, which had been used to divert the water of the Kankakee river into the feeder, had been removed and the river restored to its original channel. The wooden aqueduct and the stone piers upon which it stood, through which the waters of the feeder were passed over the Desplaines river, had been allowed to fall into decay. The mouth of the feeder had been filled up under the direction of the canal commissioners. Two railroads had been permitted to construct solid embankments across the feeder, upon which they maintain tracks and operate railroads. Farmers owning lands along the feeder have been allowed to cut down the banks and run fences across the feeder without restriction. There is not the remotest probability that this feeder will ever again be used by the State in connection with the canal.

It appears from the foregoing facts that the validity of the lease of this feeder cannot be questioned on the ground that the exercising of the rights granted will interfere in

any way with the rights of the State or the public in the canal. With an ample supply of water from Lake Michigan it is not within the range of reasonable probability that this channel will ever be needed to feed the canal. Engineer Cooley testified that he could not foresee any state or condition which would render its future use necessary. But even if we may suppose a possibility that this feeder may be again needed by the State, the power to cancel this lease is expressly reserved to the canal commissioners. Again, if such necessity should arise, the things that the lessee is authorized to do by this lease would seem to be in line with the reconstruction of such feeder so that it would become usable. The lessee is authorized to reconstruct the dam in the Kankakee river, to repair the banks of the feeder and to perform other work necessary to cause the water to again pass through the feeder, all of which would be advantageous to the State should it again desire to use this channel. In our opinion there is no legal reason why the canal commissioners may not treat this abandoned feeder, and the lands and lots connected therewith, as other canal property, and lease the same during such time as it is not needed, for any lawful purpose that does not interfere with whatever rights the State may have to resume the use of this feeder for canal purposes. The title of the State to this feeder was not acquired by a grant from the United States government, as was the case with the canal proper, but the right of way for the feeder was obtained, in part, at least, by deeds from private owners of the lands over which it passed. A number of such deeds were introduced at the trial, and all of them contained the following condition: "Provided, however, if the said feeder should not be constructed over and through the said premises, or if, after the construction of the same, it should be by the decision of the board of trustees, their successors or assigns, abandoned and discontinued or the route thereof changed so as not to be continued over the said premises, then and in that case the said lands hereby granted shall revert to the said ..... and assigns." The blank in the last line was filled in with the name of the grantor. The evidence shows that as to a portion of the right of way for the feeder no paper title in the State could be found. It thus appears that a question may arise between the State and those entitled to the reversionary interest under the deeds, whether the State has any title or interest in the right of way of this feeder. This question we do not determine. The

claimants of such reversionary interests are not parties to this suit. Such rights, whatever they may be, will not be affected by the lease or anything that may be done by appellee thereunder. Without determining whether the State has any title or rights in the right of way of this feeder as against persons who may have succeeded to the reversion, and without deciding that the lessee has acquired any rights under the said lease as against such reversioners, our conclusion is that, as between the State on the one hand and the appellee on the other, no legal reason exists why this contract should be declared void.

*The pole lease.*—The contract designated "the pole lease" was executed September 2, 1904, between the canal commissioners and Griswold, and grants to the lessee the right to erect and maintain a line of poles along and upon the land belonging to the State, part and parcel of the Illinois and Michigan canal lands, to be located between the west line of section 25, township 34, range 8, in Grundy county, to Roby street, in the city of Joliet, in Will county, and between said west line of said section 25 and the western limits of the city of Morris, said line of poles to be placed on the berme side of the canal under the directions of the officers of the canal. Said lease is for a term of twenty years, and is made subject to existing pole leases, and also subject to the right to require a change in the location of the poles at any time when, in the judgment of the superintendent or person in charge of the canal property, such change is necessary. The consideration paid for this lease is \$1000. Said poles are to be used by the lessee only in stringing wires to carry electricity generated at the proposed plant. The lessee agrees and covenants to erect and maintain the poles and wires in a good and workmanlike manner and in such way as not to interfere with the business of the canal or the property of others, and to assume all liability for deaths or personal injuries that may result from the use of such poles and wires, and to indemnify and save harmless the canal commissioners for all claims for damages to either person or property. Neither this lease nor the Kankakee feeder lease is of vital importance to the decision of the appellant's right to enjoin the construction of the proposed dam. Whatever view we might entertain in respect to these two contracts, it could not influence the ultimate result of this litigation. There are no reasons urged against the validity of the pole lease which have not been considered in connection with the other contracts, except that

appellant contends that the pole lease gave the lessee control of the tow-path of the canal for a distance of twenty-five miles. This is a misapprehension. The poles are to be placed on the berme side of the canal, which is the opposite side from the tow-path, except "where, in the judgment of said superintendent or officer, the topography of the ground makes it necessary or expedient to have said poles upon the tow-path bank of said canal, the authority is hereby given to said party of the second part to cross said canal and place poles along the said tow-path bank, the necessity or expediency thereof, the place and manner of crossing and placing said poles along said tow-path bank to be subject to the approval and under the direction and supervision of said superintendent or officer. It is distinctly understood, however, that the aforesaid line of poles shall not, in any event, be located or maintained in such place or manner as to interfere with the use or operation of said canal." As thus carefully guarded we are unable to see how it will interfere with the use of the canal or the tow-path. Unless it does so interfere, we see no reason why the contract should be declared void.

*Conclusion.*—It is seldom a case is presented to a court involving so many questions, both of law and fact, as are presented by this record. We have given the questions involved that careful consideration which their importance seems to demand. In view of the wide range covered by the evidence and the able and exhaustive arguments of counsel we have found it impracticable to discuss all of the questions raised or notice in detail all of the arguments presented, within the reasonable bounds of an opinion. We have, however, considered all of the questions, and discussed such of them in the preceding opinion as appear to be necessary to a proper determination of the legal rights of the parties. After giving due consideration to all that has been said by counsel in support of the several contentions of the State, together with such additional matters as our own investigation has disclosed, we have reached the conclusion that there is no equity in appellant's bill and that the same was properly dismissed by the court below.

The decree is affirmed.

*Decree affirmed.*

STATE OF ILLINOIS, }  
SUPREME COURT. } ss.

I, J. McCan Davis, Clerk of the Supreme Court of the State of Illinois, and keeper of the Records and seal thereof, do hereby certify that the foregoing is a true copy of the opinion of the said Supreme Court in the above entitled cause of record in my office.

This copy is not to operate as a mandate in any event. Mandate will be issued only on request and payment of costs.

In Testimony Whereof, I have set by hand and affixed the seal of the said Supreme Court at Springfield, this 27th day of October, A. D. 1909.

(Seal.) J. McCAN DAVIS,  
*Clerk of the Supreme Court.*

NOTE:—The foregoing opinion appears in 241 Illinois, pages 290-365.

995 GEORGE W. RAYMOND, witness for complainant, testified as follows:

*Direct Examination.*

I will be 70 years old the 20th day of next May. I live in Morris, Grundy county, Illinois. Have lived there nine years. Before that I lived in the town of Norman, Grundy county, in section 32, range 6. I have lived in Grundy county about 40 years. I was born in Big Grove township, at that time a part of La Salle county, Illinois. In 1855, my father bought a 996 half section of land where my farm now is. This farm, which I now own, is the northwest 200 acres of section 32, range 6, and is about a mile directly south of the south bank of the Illinois River. I remember the very high water in the Illinois River in 1857. As to how high the water was at that time, would say that I was a good swimmer. My brother sent me to Morris to get some milling done. On the south bank, to approach the ferry, I put what grain I had on some boards on top of the wagon box. I managed to get to the little ridge along next to the south bank and there got onto a ferry, and when I got there I crossed over and got my milling done, and bought my groceries, and by that time the river had risen so that it was impassable, so I took down the north bank down to about what they called at that time McMillan farm. That was nearly, not quite, opposite our farm and there I put my horses up and stowed away my stuff, and I got one of the boys to row me over the river and walked afoot over to our home.

Our team remained there about two weeks. Then I went 997 over and got an old scow flat boat; put my wagon and my team on and my commodities and I started. I landed about two miles below on the opposite bank, by tying up before the boat got to shore and got near enough so that I got my team and wagon off. As to whether there was any local bench mark or high water mark preserved locating the height of that high water of 1857, would say that there was a tree between my house and the bottom road, a hackberry tree where just at the roots there was a high water mark. That had already been taken out and obliterated. But I could approach it within a reasonable distance. The high water of 1857 was six feet higher, I should say, than it was last year (1907). I am acquainted with the local reputation among the Indians who were still living in that vicinity at the time of the high



water of 1857. The Pottowatamie chief Shabbona lived and died about a mile and a half from the farm I own now. 998 I knew him very well. I conversed with him about the local reputation of the state of water in the river. I compared with him the local reputation of the former waters known to him with that of 1857. When I went over to McMillan after my horses, wagons, etc., I told Shabbona by motions and talk that I wanted to get crossed over. He called a couple of squaws and they motioned to me and we went up the river a ways and they had what we call a canoe; and I seated myself nicely down in the bottom and they paddled me across, and I gave them a quarter of a dollar. I used to be very friendly with the old chief and I gave him a part of a sack of that flour that I got over on the scow and I asked him in regard to the water at that time and he made motion and he showed me—he put his cane up this way (indicating) “So; there, so, up.” In the Indian way. He would understand very well what you said to him and he possessed that peculiar Indian way, a good deal of sign language as well as words. The height that he indicated was four feet higher, I should say, than the level of 1857. As to whether he ever talked to me about the local 999 reputation of the use of the stream in the early days by the settlers and explorers, would say that he told me one time, motioned that he was a small boy about three feet high, that “Me go this way, so, around Seneca.” Seneca is in a low swale north of the river; is probably twenty feet above the natural flow of the Illinois River. One time he said they could go from here around so with canoes; Indians; when he was a small boy. At that time I presume likely Shabbona was 80 years of age. Shabbona used to stay at my house quite often and I asked him at that time when he was there in regard to getting my team over if the white men years ago used to go up and down. He said, “White men go so, so.”

Q. Pointed both ways?

A. “So.” He said, “Didn’t go up stream, but they went this way (indicating).”

Q. Down stream?

A. Down stream.

My farm is located southwest of Morris, between Morris and Seneca near the Illinois River. It is approximately 13

miles distant from Morris. It is 8 miles further up to Au Sable. As to whether my farm is located in the vicinity of the south bank of the Illinois River some 23 miles below the mouth of the Desplaines River, would say that if your statements are correct that is so. As to whether in my conversation with this old Indian I gathered from his statements to me that the white men never went north of my farm up the river, would say that they never went up stream.

Q. Never went up stream, but went from that point down the Illinois and into the Mississippi?

A. Yes. Well, he didn't say that—

1001 Mr. Starr: He didn't say from that point.

Q. Well, went down the stream?

A. Went down the stream.

Q. But not up stream?

A. No sir. Some two weeks after the flood of 1857, I went after my horses and got them on this flatboat, but before I could get across I had gone down the stream about two miles. The current was pretty swift. It was impossible at that time to row a boat up stream. I took an angling course to get across, and I went across just as quick as I could, that is,

took the shortest distance. I have had some experience  
1002 in navigation and boating on the Mississippi, the Arkansas and the White River. This experience covered about two years time. As to whether or not the Illinois River from the point where my farm is some 23 miles below the mouth of the Desplaines River is capable of carrying the commerce of this territory adjacent to the Illinois River in the ordinary way in which commerce is carried on (to which objection was made on the ground that it was not proper cross-examination, no foundation laid and incompetent, irrelevant and immaterial), I would say that I cannot state the condition of the Illinois River from the mouth of the Au Sable up towards the Desplaines. I never went over that ground. From that

point down to where my farm is located or even below as  
1003 a practical mode of transportation it is not so. I refer to both present and past conditions. From the signs that Shabbona communicated to me he gave me to understand that he had been familiar with the river since he was a boy of five or six years. He belonged to the tribe of Pottawatamie Indians. In 1857 I was 20 years old.

Q. Have you ever heard—do you know anything about the Desplaines River and its adaptability for carrying commerce?

A. Personally I do not.

1253 JOHN McCOWAN, a witness for the defendant, testified as follows:

*Direct Examination by Mr. Munroe.*

Q. Your name is William McCowan?

A. No, John. I have been called as a witness in this case before. I testified in my former examination, I believe, that I live near the wide water, in the Township of Channahon. I

went to Channahon Township the 28th day of May, 1835.

1254 I knew all the neighbors in the township shortly after

I came there,—all that were anywhere near Channahon.

Of course, I heard of the others: The Linebargers; there was the Trite, and the Eibses, Jessups, Morehouse, Schermerhorn, Knapp and the two Tryon brothers. That is all that

I knew,—there might have been some others. I knew John and Edwin Jessup. Mr. Prior was a cousin of John and Ed-

win; I was 9 and he was 18, and I think the Jessup brothers,

that is, the two older brothers were a year or two older

1255 than he was. I ain't certain about their ages. I knew

them well and intimately. Ofter went to their house and

often met them. The Jessups lived in a log house when I came to Channahon in 1835. I could not state just how long

they lived in that log house, as it was quite a number of years.

My father built the first sawed lumber house in the Township of Channahon; it was a small house, but it was a house;

and Judge William D. Beck,—his name is mentioned in

“Woodruff's History of Will County,”—those two buildings were the first sawed lumber houses in the Township of Channahon. The lumber that went into those houses came from

Jack's mill, about four miles north of the Village of Channahon, on the DuPage River, and on the east bank of it.

1256 These houses were build in 1835, and that mill was in

operation at that time. The Jessups had a log house,

and in the rural communities they wasn't in no great hurry

about getting lumber houses, and I cannot say just exactly

when they build their house. This old man Jessup's house,—

Isaac Jessup's house,—him and his two sons, or four sons

rather, lived there together in this log house; and how long

they lived in the log house, before the farm house, or board

house, or whatever you have a mind to call it, I don't know;

that is, I don't remember.

The lumber that the Jessup's built their house of, part of it

came from Chicago. That was a soft wood lumber they hewed the sills out. The soft wood lumber came from Chicago and the hardwood lumber, the same as the joists and studding, in the old house,—the Isaac Jessup house,—the first house east of what is called the Lewis house,—came from Jack's mill.

1257 I know the Jessup's didn't own any boat; I could not say about a skiff, because most everybody had a skiff, or Indian canoe hewed out of a log, but they didn't have any kind of a boat that you could carry lumber on. They didn't ever carry any lumber for any of the mills in the vicinity of Channahon that I ever heard of.

Q. Mr. W. W. Stevens has testified that Mr. Jessup told him in 1855 that they owned a boat and made frequent trips to saw mills in Wilmington in order to get lumber to build houses for the early settlers in Channahon. Do you know whether that is true or not?

A. I know they never had a boat to do that kind of work.

I could not say whether Channahon was settled before Wilmington was settled. There might have been a little hamlet there. Of course, I didn't know anything about Wilmington until about 1840. There was not any house built there before the canal with lumber from Wilmington. I know every house

that was built there within a radius of four or five miles  
1258 of me, and the stuff came from Jack's mill and from Chicago. When they brought it from Chicago, they brought it sometimes with ox-teams, and some had horses and then they brought it with horse-teams.

Q. Mr. W. W. Stevens has also testified that a man by the name of Fish had a saloon near Au Sable, and got his whisky down from Chicago by boats.

A. I never saw anything at all at Au Sable until Mr. McNellis built a distillery there.

That was about the time of the opening of the Illinois  
1259 and Michigan Canal. There was whiskey and such things brought down from Chicago to Joliet. I brought down two barrels at one time with a yoke of oxen. It must have been about 1844, because that was the year we bought our horse team; and teams were going back and forth between Joliet and Chicago,—not every day because they only went when the farmers wanted to carry their produce, and then the Joliet merchants got them to bring stuff down. There was no store in Channahon in them days. You had to go to Joliet

for your provisions. Joliet was the staple town. No,  
1260 I don't think people went to Wilmington to get supplies,  
because Joliet was closer.

There was another saw-mill on the DuPage River besides Jack's saw-mill at an early day, but not so early as Jack's. That was located about a mile,—no, about three-quarters of a mile down the DuPage, from the road from where the broken bridge is.

I testified that I took my crop of corn in the year '35 to a grist mill at Treat's Island to be milled. I cannot say when the saw-mill was built at Treat's Island; that ain't fixed in my mind; I know it was quite a while after that,—that is after '35.

*Cross-Examination.*

I came to that community in 1835. I was 8½ years old. I was not here before that. I came from York State out  
1261 there. The Jessup family which I mentioned lived in a log house. I did not see the log house built because it was built previous to 1835. They lived in it to 1834. Jessup and Morehouses came here in '34, and old Judge Peck came from Point Hook Landing. The Jessups and Morehouses came from Shodick's Landing. It was common talk all through the community. The community was not very large. There was the Shermerhorn, Morehouse and Jessup families came from Shodick's Landing. Quite a number of log houses were built after I came to that point. I saw some of them built and saw them after they were built. The logs came from the woods. There were plenty of woods all around there. They went to the timber and cut them down and hauled them where they wanted them and rolled them up. These logs were not transported on the water, nor transported on wagons part of the way and water part of the way. They were cut right in the timber and transported where they were wanted.  
1262 Some of them were transported by wagons and some of them by log chains with cattle on,—two or three yokes, depending on the length of the log. I've seen three yoke of cattle on a log. A great many of the logs were chopped right in the timber that surrounded the mill. There was two or three hundred acres of good timber land, but they did not happen to have much walnut in that grove,—black walnut; it was principally oak and bass wood. Logs were brought from a distance, from our place, which was just about two miles above the village of Channahon.

None of these logs were transported by being floated on the water. I stated that pine lumber came from Chicago. I said pine lumber; basswood is a soft wood, but that did not come from Chicago. Pine lumber came from Chicago because there was no pine in this country, nor even in Chicago, that was shipped down.

1263 The 24th day of May, 1835, there was a raft of pine logs brought down along the lake shore, a mile and a quarter long, and they had to cut it in pieces before they could get it up in the Chicago River. I did not stop to see what became of it, because I left there the 26th. I presume it was hauled out on the beach. There were no wharves and no docks; but I suppose they had teams that hauled them out when they got them loose and they hewed them up. I didn't state this from positive knowledge, but I seen the raft come there and I seen them commence to pull them out with teams, but I didn't see them manufacture it.

I am familiar with the Desplaines River from points nearby, July, 1835, to the present day. I didn't ever see any rafts or logs either in large quantities or small quantities floated down the river; never saw any such thing, because there was no necessity for it. There was heavy timber, and they even got saw-mills, steam saw-mills, to saw logs up,—that is, in the later days, and there was no necessity for timber to be floated on the river, because the mills were built near the timber.

1264 I have seen skiffs on the Desplaines River which carried equipments. These skiffs would probably carry two men and probably carry four or five hundred weight. I have never seen any boats on the river larger than those skiffs. It would be impossible for them to go a great ways from 1835 until the drainage floated the water down here from Chicago and from Lake Michigan. I didn't ever see any boats larger than those skiffs go short distances.

5319 CHARLES A. MUNROE, a witness for defendant, testified as follows:

*Direct Examination.*

My name is Charles A. Munroe. I am the Mr. Munroe, who has been referred to in the testimony here quite frequently. I am an attorney by profession. I have not practiced my profession for about two or three years. I first became identified with this project to build a dam on the Desplaines River, somewhere in the neighborhood of the Illinois in the spring of 1904. I had not any connection at that time of any nature with the Economy Light & Power Company. The first time that I had any negotiations with the Economy Light & Power Company in reference to this project was in May, the latter part of April, or the first week in April, 1906.

Q. In the meantime you had acquired flowage rights, or ownership to a large proportion of this property as shown on Woermann's Exhibit 1, June 15, 1908, and Woermann Exhibit 2, June 15, 1908, had you not?

5320 Objected to as incompetent, irrelevant and immaterial and not the best evidence; overruled.

A. I had acquired title to all of the property, contracts for title to all of the property shown in colors on those two exhibits, and had made all financial arrangements for constructing the power house and dam at the mouth of the Desplaines River.

COUNSEL FOR COMPLAINANT. I move that the latter part of the answer be stricken out.

Sustained.

COUNSEL FOR DEFENDANT. I will ask another question.

Q. Had you made any arrangements with reference to constructing this dam before you had any negotiations with the Economy Light & Power Company?

A. Yes, sir.

Q. Please state what they are.

Objected to as incompetent, irrelevant and immaterial; overruled.

A. Yes, sir; and the arrangements were completed for constructing, in the spring of 1906, a power plant at the mouth of the Desplaines River, at substantially the same location, and of the same character as the power house the Economy



Light & Power Company is now attempting to construct.

5321 Q. How many acres of land have you acquired?

COUNSEL FOR COMPLAINANT. Objected to as incompetent, irrelevant and immaterial and as not the best evidence.

A. About seventeen hundred.

Q. When did your negotiations with the Economy Light & Power Company ripen into a definite contract?

COUNSEL FOR COMPLAINANT. I suppose it is not necessary to repeat the objection.

The COURT. No; your objection may go to the whole line.

A. (Continued.) The 31st of July, 1906, the arrangements were made, subject to examination of title and were consummated by the passing of the deeds on the 30th day of November, 1906, and contemporaneous with the passing of the  
5322 deeds, the trust deeds were executed bearing date December 1, 1906, to the Royal Trust Company, trustees, to secure an issue of three millions of bonds.

COUNSEL FOR DEFENDANT. How many of those bonds have been sold, if any?

Objected to; overruled.

A. Two millions of the bonds have been sold.

Q. And the trust deed executed to the Economy Light & Power Company?

A. Yes, sir.

Q. Does the trust deed convey these properties?

A. It does.

Q. Are those bonds now outstanding?

A. They are.

COUNSEL FOR COMPLAINANT. I take it that it is understood by the court and by counsel that the objections I have made, that the evidence is incompetent, irrelevant and immaterial, and not the best evidence, is reserved to each of these questions, and I make a motion to strike out all of the testimony relative to the title to the property, and the issuing of the bonds on the same grounds.

The COURT. The contents of the trust deed is not the best evidence.

5323 Counsel for defendant offered the deed of trust from the Economy Light & Power Company to the Royal Trust Company.

Objected to as incompetent, irrelevant and immaterial; overruled.

(Said deed of trust from the Economy Light & Power Com-

pany to the Royal Trust Company was received in evidence.) (Trans., p. 6302.)

5324

*Cross-Examination.*

I did not attend the taking of the depositions on the part of the State at Joliet in the early part of this year, as the attorney for the defendant. I was there at every opportunity that it was possible for me to be there. I am not an attorney for the defendant. I am an interested party in the defendant company. I am not an attorney for it. On two or three occasions, an attorney for the defendant was not there other than myself. Mr. Porter was unable to attend the meeting which had been arranged to take the depositions, and he telephoned to me and asked me if I would attend to it, and I did, to the best of my ability. I was the only attorney that was there on the part of the defendant acting for Mr. Porter. I am the same Mr. Munroe who is shown to have been in attendance by the record in the taking of the depositions. I will

not say that when the record shows that I made objections, and asked questions, and made statements, there was no other attorney for the defendant present. I think I injected remarks once in awhile that appear in the record where I didn't have any business to do so. Well, leaving out the word "remarks," when the record shows that "Mr. Munroe" was asking questions, I was that Mr. Munroe, and generally speaking, I did that only when there was no other lawyer for the defendant there.

*Re-direct Examination.*

I am and was at the time of the taking of the depositions, the General Manager and Treasurer of the company. I have not been paid any fee, or been retained and do not expect any fee as attorney in this case. I learned when I was an attorney, that a party in interest might conduct his own suit if he wanted to, but I learned it was bad policy to attempt it. My connection with the Economy Light & Power Company began when the manager of the Economy Light & Power Company died on the 12th of January, 1907, and on the 16th of that month, I was appointed to his position. It has been testified here that I have paid certain moneys to the contractor, and have made certain contracts with him; in

addition to that, the Economy Company has paid out moneys on account of the construction of this work, about \$135,000. That is for machinery and wheels. In April of 1907, we purchased \$142,000 worth of hydraulic machinery for this plant, upon which we paid \$55,000, and engineers' expenses and payments for work done by the contractor, and to the contractor.

Q. What is your approximate estimate of the entire cost of the work?

5327 COUNSEL FOR COMPLAINANT. I suppose it is understood that my objections to this as incompetent, irrelevant and immaterial, stand to all of this supplemental evidence.

The COURT. Yes.

A. Nine hundred thousand dollars; that is exclusive of the land.

Abstract of trust deed offered at trans. p. 5323 of the record in the state case, as it appears in abstract of state case at page 1854a.

Economy Light & Power Company	{	Trust Deed dated De-
to		cember 1, 1906.
Royal Trust Company.		Recorded..... Consideration, \$1.00.

Property conveyed:—twenty-two (22) city lots in North Joliet,

the Dam No. 1 lease;

the lands situated in various sections in Township thirty-four (34) north, Range nine (9), Will County;

the full and free use, benefit and enjoyment of a certain stream of water called the Des Plaines River, flowing through certain lands, as it may be necessary for said Economy Light & Power Company, its successors and assigns to take, flow, injure or damage, in order to utilize the fall in said river;

and also certain other lands situated in Township thirty-five (35) north, Range ten (10), Will County;

the contract between Harold F. Griswold and the conservator of the Estate of Harvey Glidden.

the Griswold lease from the Canal Commissioners, dated September 2, 1904;

the agreement between Harold F. Griswold and Peter Conroy;

the pole line contract of the Canal Commissioners dated September 2, 1904;

the Kankakee Feeder lease between Canal Commissioners and Charles A. Munroe, dated January 5, 1905,

and all other contracts assigned by Harold F. Griswold and Charles A. Munroe to the Economy Light & Power Company.

Secures an issue of 3,000 First Mortgage 5 per cent. Bonds of \$1,000 each of said Economy Light & Power Company aggregating in amount \$3,000,000, said bonds being dated December 1, 1906, and payable December 1, 1956.

Article 6. 790 bonds to be issued to retire former bonds and bonds No. 791 to 2,000, inclusive, to be delivered to Trustee for certification and proceeds to be used to pay \$138,000 of floating debt and \$274,000 to be used for purchase of lands, flowage rights and contract rights and other property, and the remainder of the proceeds of said 1,210 bonds so far as necessary to be used to pay the cost of constructing dam, water power works, etc., and balance to be held for future sale.

